The Sharpshooter February 2018

A QUARTERLY NEWSLETTER BY THE OREGON SOCIETY OF SOIL SCIENTISTS



Join us at our Winter Meeting
Growing your Soil Health Toolbox
Corvallis Courtyard by Marriott
Eve of Feb 28th—3:00 Mar 2nd

Eve of Feb 28th—3:00 Mar 2nd REGISTER HERE NOW



Presidents Message

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As a strong soil science society, we have amazing knowledge resources available to us. Many talented experts will join us at our Annual Winter Meeting, to present new data and guide us through conversations. However, they have been informed that discussion time should be built into every topic. Discussion and debate driven from various perspectives and experiences are what makes a society useful.

This year we will meet to discuss issues surrounding soil health. I have spent a lot of time in the last year thinking, talking, measuring, and reading about soil health and I look forward to hearing what you have to say.

Through my time in graduate school, the Oregon Society of Soil Scientists has opened my eyes to new understanding of soil processes I didn't know that I didn't know. As I write my dissertation now, I catch myself reflecting on the various con-

versations with fellow members, standing in the rain, with a ball of soil in my hand, and wonder in my heart, and I want to thank the Oregon Society of Soil Scientists for helping me to expand my understanding.



I am so excited to share with you the program we have put together for this years Annual Winter Meeting. Details will be found throughout this publication.

~Shannon Andrews



Join us at the OSSS Annual Winter Meeting Corvallis Courtyard Marriott

5:00pm Feb 28 – 3:00pm March 2nd, 2018



We have a very exciting line up of speakers to provide tools to help increase the effectiveness of soil scientists communicating with producers and policy makers regarding implementation of soil health principles. It takes all kinds, please come share your perspective.

Our Keynote Speaker will be **David Montgomery**, renowned geomorphologist and communicator.

We encourage you to check out his books prior to the meeting. Get them signed on Weds evening!

Talks will include: soil health assessment interpretation with results from our field sites, strategies for reducing disturbance and cover cropping, disease suppressive soils, economic tools, and practice with demonstration tools

For registration, membership, and the full agenda, visit our website

www.oregonsoils.org

Registration Details

\$160 for Members, \$75 for Students, \$225 for Non-members

Membership prices:

\$50 Regular, \$30 Student, \$500 lifetime

Registration includes:

- Breakfast and Lunch Thurs and Fri
- Appetizers Weds and Thurs
- Transportation for Field Tour
- 13 hours of CEUs—including Ethics



Agenda OSSS Winter Meeting: Growing your Soil Health Toolbox

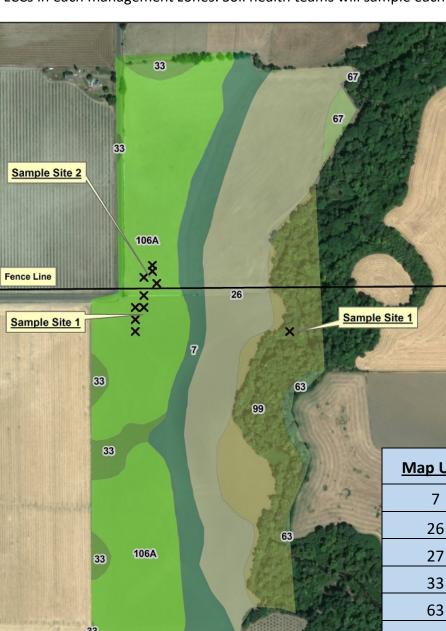
Weds Feb 28th

| 4-5:00pm | Check in - registration | Corvallis Couryard by Ma | arriott |
|--------------|---|--|--|
| 5:00 | OSSS Annual Membership Meeting | Appetizers + Happy Hou | |
| 6:30 | Keynote: Growing a Revolution | David Montgomery | U of Washington Geo- morphology |
| 7:30 | Mix and Mingle and Book Signing | | |
| Thursday | , March 1st | | |
| 7:00am | Check in/registration, coffee, tea, breakfast | Provided | |
| 8:00 | Opening Remarks | Shannon Andrews | OSU |
| 8:30 | The Hidden Half of Nature: The Microbial Roots of Life and Health | David Montgomery | U of Washington Geo- morphology |
| 9:20 | Break | | |
| 9:30 | Reduced tillage: stratification, equipment, practical skills | Don Wysocki | OSU Crop and Soil Sci- ence Extension |
| 10:20 | Break | | |
| 10:30 | Economic tools to help with management decisions | John Antle | OSU Applied Economics |
| 11:20 | The ethics of snake oil: the pitfalls of perpetuating below ground myths and legends. | Kristin Trippe | USDA Agricultural Research Service |
| 12:00 | Lunch - Taco Bar | Provided | |
| 1:00 1:50 | Using land capability class to bin soils for soil health scoring Break | Shannon Andrews | OSU CSS |
| 2:00 | The Role of Microbial Communities in Disease Suppressive Soils: A Case Study | Tim Paulitz | USDA ARS - WSU |
| 2:50 | Break | | |
| 3:00 | Cover Crop Tools | Annie Young-Mathews and Nick Sirovatka | NRCS Soil Conservation |
| 3:50 | Break | | |
| 4:00 | Making it work in Oregon: Effective communication for increased adoption | Garrett Duyck, Gabrielle Roesch-McNally | NRCS and Climate Hub |
| 5-7:00 | Poster Session and Happy Hour with Apps | Provided | |
| Friday, M | arch 2nd | | |
| 7:00am | Coffee, tea, breakfast | Provided | |
| 8:00 | Opening Remarks | Shannon Andrews | OSU Crop and Soil Science |
| 8:15 | Soil Health Assessment Interpretation | Jenn Moore-Kucera | NRCS Soil Health Division Leader |
| 9:00 | Load UP | | |
| 9:45 | Hear from producer about practices, principles, and impacts | Don Wirth | Owner - Saddle Butte Ag |
| 10:15 | Split into groups for sample collection | Shannon Andrews | OSU CSS |
| 10:20 | Sampling and pit prep | Groups | OSSS |
| 11:00 | Inspection of soil pits and health samples | OSSS | OSSS |
| 12:00 | Lunch | Provided | |
| 1:00 | Discussion of soil health test interpretation | Jenn Moore-Kucera | NRCS Soil Health |
| 1:30 | Discussion about LCC vs Management Differences in soils | Shannon Andrews | OSU CSS |
| 2:00 | Soil Health on Site Demonstration Tools | Nick Sirovatka | NRCS Soil Conservation |
| 3:00 | Load UP | | |

Testing the Land Capability Class Groups for Soil Health

Friday March 2nd Field Tour Sites Near 3114 Wirth Rd. Tangent OR

Winter meeting field tour participants will have the opportunity to assess USDA-NRCS Land Capability Class (LCC) categorization and whether these categories translate to meaningful differences in the soil health scoring system. We will see familiar Willamette valley soils with alluvium and glacio-lacustrine parent materials, but also hope to discuss interpretation through the lens of soil health. We will be visiting the area mapped below. Official series descriptions are linked in the table. Half of the land (separated by fence line) is managed with regenerative or conservation ag practices while the other half does not employ these practices. Within our field site, there are soils which classify as 2w, 3w, and 4w LCCs in each management zones. Soil health teams will sample each LCC on each management zone, for



a total of 6 replicates to compare and examine back at the soil pit area. We will discuss the use of LCCs as a means of categorizing soils versus the observed site characteristics. Prior to this field tour, a thorough laboratory soil health assessment was completed for each site. Discussion about the relevance of soil health test results alongside the soil differences by LCC and management type will be encouraged. There will also be field demonstration tools available for use. These tools have the ability to make a strong impact on producers, so its a great chance to try them out if you work with farmers.

| Map Unit | <u>Name</u> | <u>LCC</u> |
|----------|----------------|------------|
| 7 | <u>Awbrig</u> | 4w |
| 26 | Coburg | 2w |
| 27 | Concord | 3w |
| 33 | <u>Dayton</u> | 4w |
| 63 | <u>Malabon</u> | 1 |
| 99 | <u>Wapato</u> | 3w |
| 106A | Woodburn | 2w |

Evolution of the soil organic matter concepts in relation with scientific recommendations for sustainable farming and management practices across the past 300 years. From R.J Manlay et al 2007 in Agriculture, Ecosystems and Environment 119: 217-233

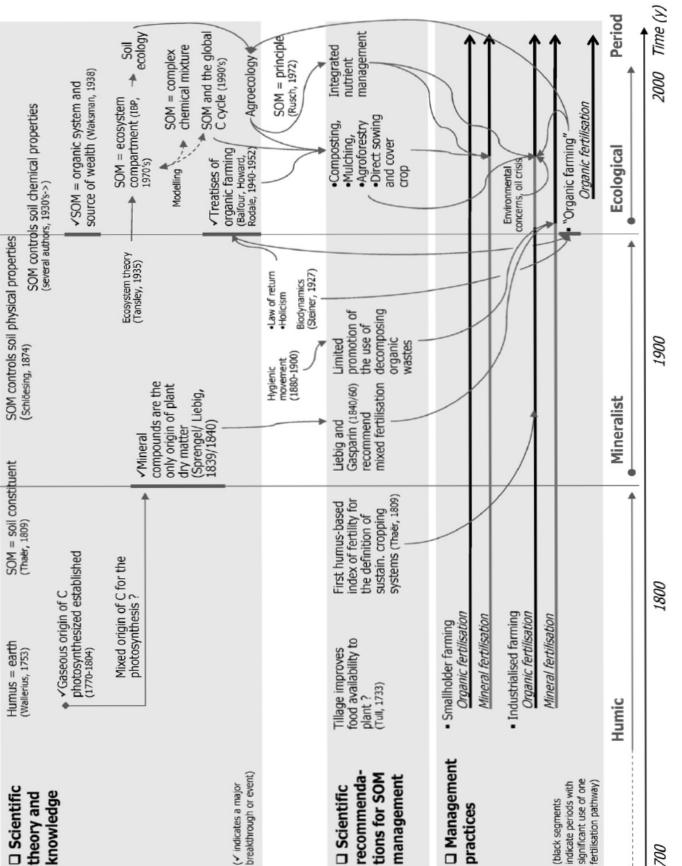
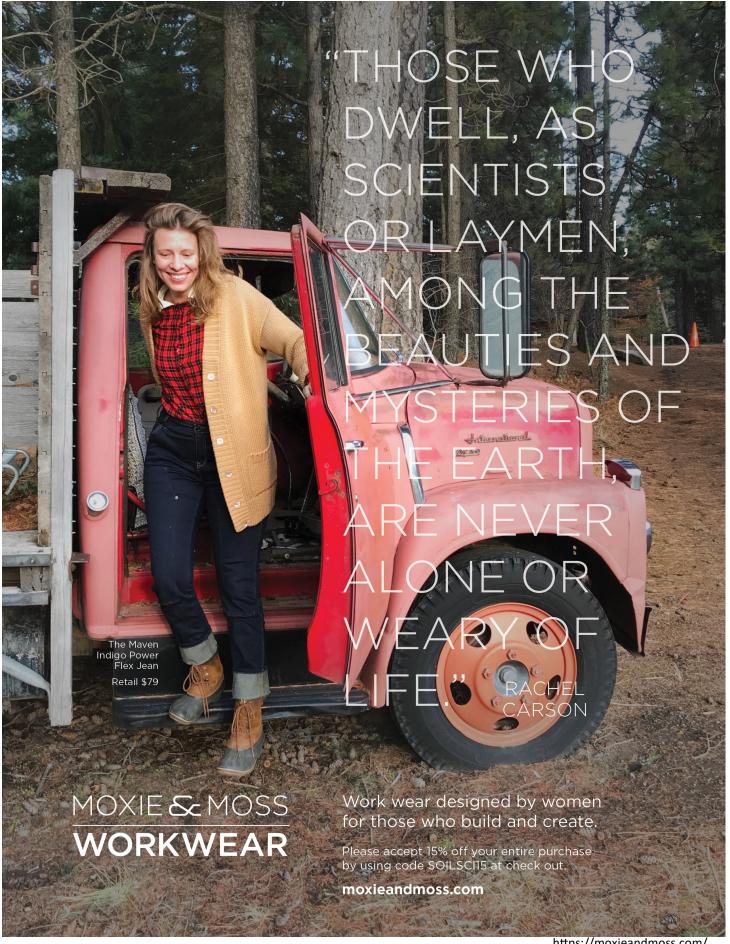


Fig. 2. Evolution of the soil organic matter concepts in relation with scientific recommendations for sustainable farming and management practices across the past 300 years.



Bill Expands Access to Crop Insurance and Commitment to Conservation NSAC supports effort to modernize crop insurance program

~Reana Kovalik | National Sustainable Agriculture Coalition Blog

January 19, 2018 | rkovalcik@sustainableagriculture.net

Washington, DC, January 19, 2018 – Today, Representative Rick Nolan (D-MN), Ranking Member of the House Agriculture Committee's General Farm Commodities and Risk Management Subcommittee, introduced the Crop Insurance Modernization Act of 2018. The National Sustainable Agriculture Coalition (NSAC) strongly supports Congressman Nolan's bill, which would expand access to risk management tools to currently underserved farmers (e.g., specialty crop, livestock, beginning, organic, and direct to consumer farmers) and create a stronger link between federal risk management programs and conservation priorities.

"The federal crop insurance program is a major component of the farm safety net," said Paul Wolfe, NSAC Senior Policy Specialist. "Currently, however, the program fails to adequately support many types of farmers, crops, and growing practices. It also lacks a strong connection to conservation activities, which are an inherent part of risk management because they make a farm operation more resilient long-term. NSAC thanks Congressman Nolan for championing the Crop Insurance Modernization Act of 2018, and for his leadership in strengthening the farm safety net."

Currently, less than 50 percent of farms with more than \$10,000 in revenue have crop insurance. This means that not only are many smaller-scale operations being left out, but that the program is also not providing medium and larger-scale operations with the policies or the risk management tools they need.

The Crop Insurance Modernization Act of 2018 will improve access to the federal crop insurance program for beginning farmers, farmers with diverse crops and enterprises, specialty crop operations, organic farmers, farmers using non-wholesale markets, and other underserved farmers by:

- Expanding premium discounts for beginning farmers.
- Streamlining the Whole Farm Revenue Protection program to better serve diversified family farms.
- Requiring the U.S. Department of Agriculture's (USDA) Risk Management Agency (RMA) to study the barriers to accessing crop insurance, particularly by beginning and socially disadvantaged producers, and to identify options for expanded access.

This legislation will also advance conservation by promoting greater consistency and coordination between RMA and USDA's Natural Resources Conservation Service (NRCS). Disconnects between the policies of RMA and NRCS have resulted in farmers having to choose between risk management protection and conservation activities that are acknowledged by NRCS (and many others) to be a crucial part of "good farming practices". The Crop Insurance Modernization Act of 2018 will eliminate these inter-agency disconnects and strengthen the connection between risk management and conservation by:

- Ensuring that a farmer's crop insurance coverage will not be rescinded or put at risk due to their use of cover crops or other NRCS approved conservation practices.
- Launching a pilot program that rewards farmers who undertake risk-reducing conservation activities.
- Funding and standardizing conservation compliance monitoring procedures across states.

"USDA's policies on crop insurance and conservation have been working at cross purposes for too long," said Wolfe. "We must break down the institutional silos that prevent farmers from fully utilizing recognized conservation practices as part of their risk management strategies. This legislation from Congressman Nolan will lead to greater consistency at USDA and greater resilience for American farmers."

Additional details on each provision of the Crop Insurance Modernization Act of 2018 are available via the NSAC website.



OSSS SUMMER TOUR!!!

Wallowa Lake Area—#1 Oregon Bucket List Location

The OSSS Summer Tour will explore new heights on our visit to NE Oregon. See and touch glacial moraines, drifts, and tills. This region of Oregon presents a unique combination of soils and lithology not found anywhere else in Oregon. See glacial moraines from the Pleistocene and Holocene. Investigate soil development facilitated by glacial activity. Ride the Tramway to Mt. Howard and investigate alpine soils. All this and more where a unique geological mix of sedimentary, metamorphic, and granitic formations meet in the Wallowa Mountains of NE Oregon.



More Amazing Soil Adventures this Summer!

Quest for a Gelisol-Re-envisioned—Kris Osterloh

For 2018, I will lead the charge to organize the inaugural climb. We tentatively plan to find a north face route up Mt. Hood around mid-August. This is a dangerous activity, technical skills will be needed. OSSS will not provide liability coverage, participants will be responsible for their own training, health, and safety. Please contact me if you are interested in helping me organize the Quest for a Gelisol.

Kristopher.osterloh@oregonstate.edu Keep me Updated

Invitation from Pat O'Grady—Rimrock Draw Rockshelter Archaeological Dig

Last summer, during our discussions with these experts in zoo-, paleo -, and geoarchaeology we found that the way soil scientists understand sediment movement and soil development could be of great benefit to interpretation of the cultural artifacts found at each of the sites.

If you are interested in participation of archaeological site soil description, please fill out the google poll with the link below and we will keep you updated as details develop.



Keep me updated



David Montgomery

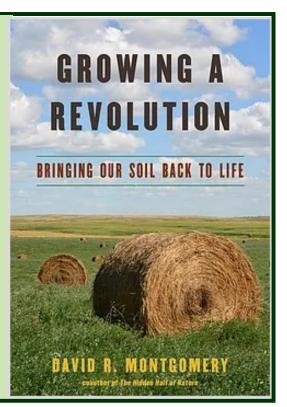
Free Public Talk

Growing a Revolution

Feb 28th, 6:30pm

Corvallis Courtyard by Marriott

400 SW 1st St, Corvallis



Growing a Revolution reveals that it's possible to bring a farm's soil back to life.

Montgomery introduces us to farmers around the world at the heart of a brewing soil health revolution. He cuts through standard debates about conventional and organic farming to show why regenerative agriculture can benefit farmers and the land.

Building on <u>The Hidden Half of Nature</u>, he finds that the combination of no-till planting, cover crops, and diverse crop rotations can sustain the soil microbiome, and thereby a farmer's crops and livelihood. Combining ancient wisdom with modern science, he makes the case for an inspiring vision where agriculture becomes the solution to environmental problems.



"O triple S" is the Oregon Society of Soil Scientists. This is an organization of soil scientists and aspiring soil scientists who want to stay connected to the vast variety of other soil scientists and fields of soils work in our region.



Vermont Agricultural Experiment Station Bulletin 135: Commercial Fertilizers. A Quarter Century of Fertilizer Inspection, Soil Deterioration and Soil Humus

Hills J.L., Jones C.H., Cutler C.

1908

While recently reading the Fred Magdoff and Harold van Es SARE book, Building Soil for a Better Crops, I found a Vermont Extension Bulletin from 1908. In this text they relate the current understanding of soil organic matter. They expound on the effects of reduced organic matter, the effects of current agricultural methods on soil humus, and methods for the maintenance and increase of soil humus supply. Expert to right

It is important to note as we move forward in our quest to revitalize agriculture through a focus on soil health, this is not a new idea. From the time of Pliny the Elder there have been written observations relating the addition of organic materials to the maintenance of soil fertility and what we call soil tilth (Manlay, 2007). The research related to soil health and the emerging understanding of the roles of the biological communities in the soil, has brought soil science back to the fundamental understanding that soil organic matter is vital to the capacity of the soil to function.



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BULLETIN 135

VIII. SOIL DETERIORATION AND SOIL HUMUS INTRODUCTION

The more obvious and immediate matter "in relation to" fertilization having been covered, it seemed fitting year before last to begin to review matters less closely connected therewith; to pass from the consideration of artificial means of soil betterment to that of natural ones. Consequently the moisture relations of the soil, particularly as regards water control, through irrigation, drainage and adequate tillage operations, were discussed at length in the 1906 bulletin, No. 123. And, in pursuit of the determination expressed therein, to discuss "sundry phases of soil management during the next few years," a review was made last year of soil biology as it relates to fertilization and particularly to the soil nitrogen content, effort being made to present the matter in as readable and popular a manner as possible without the sacrifice of essential accuracy of statement.

In further pursuit of this determination it has seemed particularly worth while, in this year and season which sees the first conference of the governors of the several states at the White House as to the conservation of the nation's natural resources, to consider somewhat in detail the causes and remedies of soil deterioration; to discuss methods of renovation; and to indicate ways by which further soil treatment may improve rather than impoverish; all this with special reference to the humus content of the soil and its maintenance. The statements of necessity overlap somewhat those hitherto made in bulletins 123 and 130, to which frequent reference is made, and are arranged under the following headings, viz.:

Introduction.—Pages 142-144.

Soil Deterioration.—Pages 144-153.

The popular explanation,-Pages 145-147.

Causes.—Pages 147-153.

- Erosion.—Pages 148-150.
- 2. Nitrogen wastage.-Page 150.
- Moisture conditions .- Page 150.
- Soil texture.—Page 150.
- Bacterial conditions.—Pages 150-151.
 Shortage of available plant food.—Pages 151-152.
- 7. Soil acidity.—rage 8. Humus.—Page 153. Soil acidity.—Page 152.

The Soil Humus Content,-Pages 153-175.

Definition.—Pages 153-155. Benefits of humus to soil.—Pages 155-158.

- As a nitrogen supply.—Pages 155-156.
 As a mineral plant food supply.—Pages 156-157.
- As a storage of water.—Page 157.
 As a source of warmth.—Pages 157-158.
- As an improver of texture.—Page 158.
 As an aid to micro-organic growth.—Page 158.



Join us at the OSSS Annual Winter Meeting

Corvallis Courtyard Marriott

Feb 28-March 2nd, 2018

| Please print and mail this form along with a check for | | | | |
|--|------------|--|--|--|
| registration and membership | | | | |
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| Name | | | | |
| Address | | | | |
| City | | | | |
| State | | | | |
| Zip | | | | |
| Phone | | | | |
| Dietary Re | strictions | | | |

Talks will include: soil health assessment interpretation with results from our field sites, strategies for reducing disturbance and cover cropping, disease suppressive soils, economic tools, and practice with demonstration tools

For more information, and the full agenda, visit our website

www.oregonsoils.org

Make Checks Payable to

Oregon Society of Soil Scientists

PO Box 391

Corvallis, OR 97339

Registration Details

\$160 for Members, \$75 for Students, \$225 for Non-members

Membership prices:

\$50 Regular, \$30 Student, \$500 lifetime

Registration includes:

- Breakfast and Lunch Thurs and Fri
- Appetizers Weds and Thurs
- Transportation for Field Tour
- 13 hours of CEUs—including Ethics
- Soil Health Resource Flash Drive

Ask for the OSSS discount and room block

Gender Disparity in Soil Science

~Marissa Theve

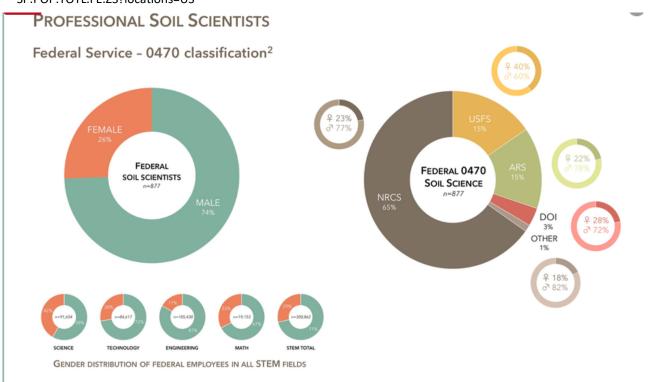
Many of us have had the experience: you glance around on the first day at a training or conference event and just as you expected, there is a noticeable disparity between the amount of masculine-expressing and feminine-expressing people (Confused? See the gender bread person: http://itspronouncedmetrosexual.com/2015/03/the-genderbread-person-v3/). A 2015 poster collaboration explores data about private sector, academic, and government professionals within soil science. It poses many important questions about the profession including "What is the gender distribution in soil science? Does this vary by discipline? By career-level?" (Berhe et al 2015). To be clear, women currently represent 51% of the United States and 50% of the world population (The World Bank Group 2018), yet represent just 26% of both federal and private consulting soil science professionals and only 24% of academic soil science faculty (Berhe et al 2015). Some of us are drawn to work with soil due to its quirk, underrepresentation, and obscurity. This modesty does not exempt soil science from the standards to which we hold broader sciences. The underrepresentation also translates to professional societies, with only two female presidents of the Soil Science Society of America since 1937, both in that role within the last 15 years (Berhe et al 2015).

The poster is a self-proclaimed conversation starter, not a complete and thorough examination. As we approach <u>Women's History Month</u>, perhaps we can reflect on the missing pieces that keep gender disparity alive: What unconscious and conscious biases do we hold? Close your eyes and picture a soil scientist- what assumptions do we make? What are the opportunities in our lives to encourage diversity in science? For further reading and reflection, the USDA-Natural Resources Conservation Service captures some accomplishments for women in soils <u>here</u>. Perhaps acknowledging women's successes more openly can take a step towards creating a prospective future for those still establishing their careers.

Works Cited

Berhe, Asmeret Asefaw, Brevik, Eric C., Christopherson, Tracy, Duball, Chelsea, Page-Dumroese, Deborah S., Kienast-Brown, Suzann, Lindbo, David L., Lynn, Lorene A., Norton, Urzula, Olson, Carolyn G., Pressler, Yamina, Thomas, Pam, Vaughan, Karen L., Weems, Stacey, Ying, Samantha C., Youngquist, Caitlin Price, Pennina, Amanda, Ash-Kropf, Zoe, Tsiafouli, Maria, Winowiecki, Leigh, and Chiartas, Jessica. 2015. State of Gender Parity in Soil Science. Available: http://www.uwyopedology.com/gender-parity-in-ss.html

The World Bank Group. 2018. Population, female (% of total): World Bank staff estimates based on age/sex distributions of United Nations Population Division's World Population Prospects. Available: https://data.worldbank.org/indicator/SP.POP.TOTL.FE.ZS?locations=US



2 Federal 0470 soil scientist and all STEM data were collected from Data Source: OPM FedScope, June 2017 available at https://www.fedscope.opm.gov/employment.asp

2018 Annual Members Meeting 5:00pm on Wednesday, February 28th Corvallis Courtyard by Marriott

Please join us for appetizers and beverages prior to the Keynote, public talk and book signing with David Montgomery. This is your opportunity to discuss what is going on in our soil science society vote on our future directions.



2018 Annual Membership Meeting Agenda

5:00 Shannon gives an overview of what we accomplished for the year

Website up and running

Summer meeting

Two interns

Two extra summer activities available

Community outreach soils events

5:10 Membership report

5:12 Treasurers report

Financial controls document - budget review

Pam got us officially as a non-for profit 501c3 organization

5:20 Voting

Responsibilities of positions up for election

Vice President is elected every year

Secretary are voted on every 2 years on even years

East-side director

West-side director

5:40 Welcome James to his Third Service as OSSS President

5:45 DEQ meeting coordination

6:00 Goals for 2018-2019

Website direction – members only area?

Social media guidelines

Open Floor

6:20 Adjorn



Membership Report Feb 5th, 2018

| Total | 67 |
|----------------------|----|
| Student Members | 14 |
| Professional Members | 26 |
| Lifetime Members | 27 |

Hey OSSS Members,

Thanks for putting up with the growing pains of getting our membership organized on the website. The numbers presented are those currently listed as members on the website. If you have had problems with membership or registration on the website. Please contact us. Osss.pres@gmail.com

Oregon Society of Soil Scientists Financial Report

~ Pam Keller, OSSS Treasurer

In 2011 the Oregon Society of Soil Scientists (OSSS) was incorporated in Oregon as a not-for-profit charitable organization. Last year we completed the process by applying for Federal tax-exempt status (501c3). We were approved Oct. 31, 2017. This means that people can take a federal tax deduction for donations to OSSS.

Also last year we finished the OSSS Financial Controls, Policies and Procedures. This document details financial practices to deter mismanagement and provide appropriate oversight.

The OSSS tracks financial transactions in a single, simple spreadsheet. Pivot tables are easily made to summarize by date range or finance category. The only OSSS bank account is a checking account with Umpqua Bank. We have two debit cards, held by the President and Treasurer. We use Stripe to process payments made on the OSSS web site and make weekly deposits to our bank account.

For the full Membership Financial Report please visit our website

FY 16 (July 1, 2016 to June 30, 2017) Summary of Income and Expenses

Income:

Uncategorized income, but consists of dues plus 2017 winter meeting registrations,

| minus PayPal transaction fees. | \$ 4537.87 |
|--|------------|
| Dues | \$ 230.00 |
| Total Income | \$ 4767.87 |
| Expenses: | |
| 2017 Winter Meeting Lodging | \$ 598.00 |
| 2017 Winter Meeting Food | \$ 1111.00 |
| Liability Insurance, Annual Premium | \$ 270.00 |
| Administrative Expense: PO Box annual fee and postage | \$ 103.05 |
| Monthly charges for PayPal Pro and MembershipWorks | \$ 262.00 |
| Oregon Sec. of State Corporation Annual Renewal for FY14 and FY15 | \$ 100.00 |
| Oregon Dept. of Justice Annual Report fees for FY14 and FY15 | \$ 20.00 |
| Oregon Dept. of Justice Annual Report late charges for FY14 and FY15 | \$ 120.00 |
| Oregon Income Tax for 4 past years | \$ 600.00 |
| Oregon Income Tax late charges | \$ 199.15 |
| Federal Income Tax for 2 past years | \$ 622.62 |
| 2017 Summer Tour Facility rental | \$ 75.00 |
| Uncategorized expense | \$ 90.00 |
| Total Expenses | \$ 4170.82 |

On the West Side

~Marissa Theve OSSS Westside Director

The Oregon Envirothon is now soliciting volunteers for the soil station!



The high school natural resources competition will take place on <u>Friday</u> <u>May 4th at the Oregon Gardens</u> in Silverton. Volunteers are needed to

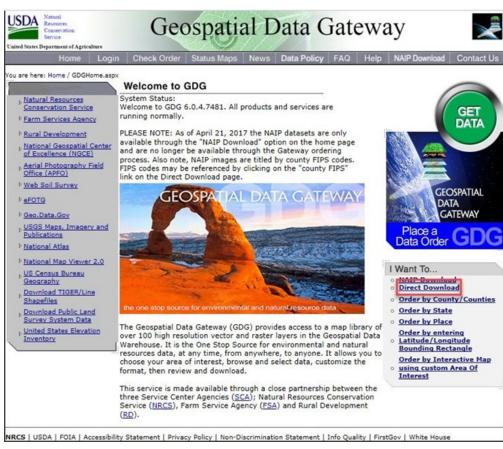
help grade and monitor the soil test sites- a great chance to help encourage the next generation of pedologists! To volunteer, please contact Marissa Theve at mtheve@blm.gov or 503-375-5650.

More information: http://www.oregonenvirothon.org/

The 2018 SSURGO and gSSURGO State data are available for download from the Geospatial Data Gateway Direct Download page.

The <u>Geospatial Data Gateway</u> is a Web-based digital map ordering and delivery system. The <u>Direct Download</u> page provides a link to the most frequently downloaded datasets without the need to place an order.

The links in the above paragraph will load the respective pages. The Direct Download page can also be accessed from the Geospatial Data Gateway home page.



SHARPSHOOTER

The Sharpshooter is the official quarterly newsletter distributed to the members of the Oregon Society of Soil Scientists. Send address changes or inquiries about membership to:

pres.osss@gmail.com or

OSSS | P.O. Box 391 | Corvallis, OR 97339

Advertisements:

Reach more than four hundred soil science professionals with an advertisement in the Sharpshooter.

Whole page—\$50, 1/2 page—\$25, 1/4/ page—\$15, or 1/6 page—\$10.

Provide a jpg file copy to the Sharpshooter editor by the deadline (first of the month—January, March, June, and November).



Membership Rates:

\$50.00 Regular Member \$30.00 Student Member \$500.00 Lifetime Member

OSSS Webpage: **www.oregonsoils.org**

Please feel free to submit an article. We welcome input from soil scientists near and far.

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