

The Sharpshooter

Oregon Society of Soil Scientists

Quarterly Newsletter

Autumn, 2020

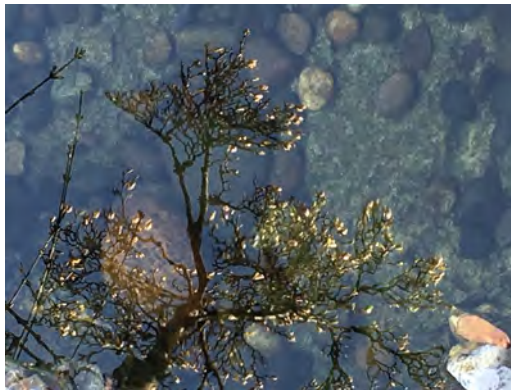


What is normal? Well, normally this time of the year the president of the Oregon Society of Soil Scientists would be writing a recap of our Summer Tour for the Sharpshooter. Then announcing the dates of the Winter Meeting and beginning to stoke your enthusiasm for the speakers, field trips and venue that we have planned.

This year we were really looking forward to an in-person Winter Meeting. But after months of hard deliberation, the board decided that meeting safely in person wouldn't have been wise, so we had to come up with a Plan B. Instead, we've been working on a series of programs that can be viewed online and we're going to need you all to pitch in.

To whet your creative juices and foster your presentation skills we are hoping to have you, our membership contribute short videos. In the video if you can talk about and showcase a soil pit you dug, a favorite road cut or some other exposed soil profile and highlight the features in the soil profile. We all have a favorite or many favorite soils, and if you can choose one, practice your presentation and then share.

Keep it concise, keep it focused, be sure the visuals are the main theme and the dialogue supports what we see. Check your lighting, keep your "ummms" "ahhs" and "ands" to a minimum, and have most importantly, have fun!



Distorted reflection of a magnolia on the cusp of bloom ; Portland Chinese Garden.
Photo Credit : Vance Almquist

We are an organization that thrives on personal interaction, hands on activities, intellectual discourse, and social connection. All of which are challenging during an infectious pandemic.

Have a good Fall, stay optimistic, and healthy,

Bruce Moffatt
President,

Oregon Society of Soil Scientists.

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The galactic bulge of the Milky Way and Mount Jefferson . Photo Credit : Roan Dickey (Corvallis, OR)



Hello and welcome to the Fall/Summer edition of the Sharpshooter. In this edition you'll find a brief report on a debris flow that occurred on Broken Top last summer and very important information on the 2020-21 Winter Meeting. Be sure and read the section on how you can participate in the winter meeting.

I want to take a moment to reflect on the past year and I am going to use the wildfires that riveted many of us in early September to do so.

I have been working on a map of wildfire vulnerability for the last couple of years. Despite working closely with that topic, I was really caught off guard by the tragedy of the Labor Day conflagrations. The speed at which they moved, the ravaging of urbanized areas (e.g. Talent/Phoenix, Medford, Mill City, Blue River, Detroit), the synchrony, and the social costs, were all unusual and shocking. But in hindsight shouldn't have been unexpected because all of the ingredients were present. The Labor Day fires were born out of overstocked and poorly structured forests (a legacy of wholesale fire suppression and extraction-focused forest management), climatic volatility and drought, antiquated building codes and regulation of infrastructure (e.g. high-tension power lines), and finally, pure meteorologic happenstance. So really it was just a matter of time until we woke to a sun-blotted out by the fiery destruction of our wishful thinking.

However, despite our intense reaction to wildfires, they can bring with them renewed ecological vitality; call it opportunity borne out of reorganization. In fact in my own work, I often use the example of how post-fire debris flows likely provide much needed coarse sediment to the many Cascadian streams currently starved of the gravels upon which salmon depend. I am not implying that just because some fire may be good, doesn't mean there isn't a limit; after all, good things are best in small doses, and fires are no exception. What I am trying to say, is that in the face of tragedy it's easy to focus on the negatives and what's been lost rather than what's become possible. And whether we face up to it or not, we're going to have to learn to embrace and work alongside fires because after all, fires entered the world stage more than 350 million years ago. Learning to live with fire is likely to be fraught with uncertainty and probably won't be easy. And to start the hard work we have to start by addressing the first obstacle—ourselves.

With that, enjoy this edition of the Sharpshooter and have a great fall!

Vance Almquist,
Sharpshooter Editor

News About the 2021 Winter Meeting

This year's meeting will be a group effort.

These times, it seems that we are all missing human interactions. Our primary goal for the OSSS 2021 Winter Meeting, which will be virtual, is to foster reconnecting with each other. We know that there is a longing to talk to our other soil science friends and colleagues and a need to create space for discussion. With that in mind, we are dedicating one of the days to society communication and sharing so it is not just data presentations on a Zoom call. We are planning an interactive program, hearing from as many members as possible, and will provide the much needed space for connection. In addition, for those of you wanting a more in-person experience while watching the virtual meeting, we are looking for several individuals willing to host small watch parties around the state. If you want to host a watch party, please contact Shannon Cappellazzi to discuss details.

\$\$ Free for all members \$\$

The general plan, two half day sessions:

Day 1, Friday March 5th:

- 4 one hour talks that will provide CEU credits (will include ethics CEUs)
- Silent auction begins - fundraiser for Soil Judges during happy hour

Day 2, Saturday March 6th:

- Society Discussion and presentations Topics (tbd) but we will have time to chat about current state of life and soil
 - Virtual soil tour

Member led pit discussions (group participation needed, described below)

Annual Membership Meeting

Board updates, elections, transfer of leadership, scholarship winners, announce 2021 scholarship

Silent auction winners announced

social games and trivia during happy hour

Virtual soils tour participation:

OSSS wants to put on the most geographically expansive winter meeting field trip ever carried out by the society! We are looking for ~10 members to dig, describe, and sample soils of your choosing. You can choose one location or a collection of pit locations that link together a conceptual thread. Because we don't have any venue expenses this year, we have funds to pay for select laboratory analyses (should they be needed) to help you tell your soil's story. If you are interested in participating/contributing to the virtual tour, please contact Shannon Cappellazzi* before Nov. 15th so that we can coordinate the sampling and testing strategy. Samples will have to be shipped on or before November 30th to provide sufficient time for analysis prior to the meeting (March 5-6th).

- OSSS Board

*scappellazzi@soilhealthinstitute.org

Odds and Ends from around the State

Oregon Envirothon 2020 Concludes

Oregon Envirothon 2020 has concluded after a year of unexpected chaos. Due to restrictions related to the COVID19 situation, the in-person event was cancelled and the competition was provided to the students by an online test. Unfortunately, many of the hands-on aspects of the event could not be offered. Despite the challenges, we had about half of our normal participation from many schools throughout the state and it is our pleasure to announce that for the first time ever Amity High School is our 2020 Oregon Envirothon Champions! We are optimistic that Oregon Envirothon will return to the in-person event in 2021, but if not, the program will be offered online again. The program is always in need of volunteers but given the current circumstances many of our efforts are on hold. If you want to get more involved contact Marissa Theve.

- Garrett Duyck



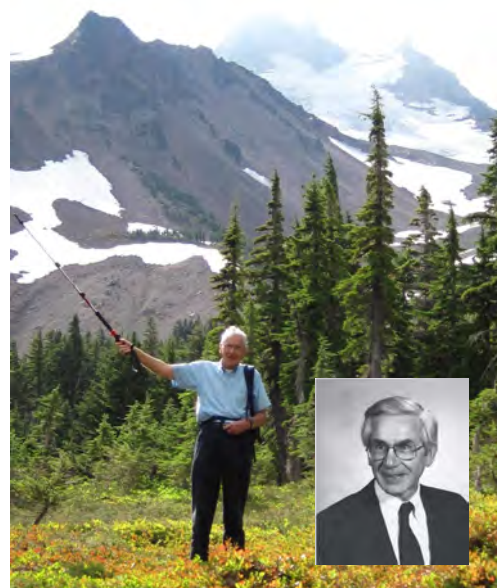
Joan Sandeno posing with lovely pink roses.

On August 23rd, Dr. Larry Boersma passed away. Dr. Boersma was a professor of Soil Physics in the department of Crop and Soil Science from 1960-1997, after which he remained active in the department as a Professor Emeritus. Larry was known for his love of hiking, scuba diving, and willingness to engage with students' intellects.

Former OSU Faculty Pass Away

In August of this year, two former faculty members of the Department of Crop and Soil Science passed away.

Joan Sandeno, a Senior Faculty Research Assistant (1987-2010), the first woman to receive a degree in microbiology from Oregon State University, passed away on August 18th. Her full obituary can be found @ <https://www.legacy.com/us/obituaries/gazettetimes/name/joan-sandeno-mcmorris-obituary?pid=196675715>



Larry using his hiking pole to point out something of interest to his fellow travelers. Photo Credit : Markus Kleber

A Report on the Debris Flow on Broken Top Mountain, August 2019

Contributed by Sarah Hash, Eastside Director

On August 29, 2019, a high-intensity rainstorm produced some dramatic hydrologic and landscape responses on the Deschutes National Forest, including a debris flow that originated high on the flanks of Broken Top Mountain.



Figure 1 - Middle Fork Tumalo Creek on August 30, 2019

Reports from crews on a wilderness fire incident indicated that as much as an inch of rain had fallen within an hour, and privately-owned weather stations at lower elevations recorded about a half

-inch of rain with a maximum intensity of six inches per hour! Some nearby RAWS stations had detected up to 0.7 inches of rainfall between 4 and 6 p.m. that day. Over the next few days, we started receiving reports that Tumalo Creek and some of its tributaries, which normally flow crystal-clear, were very turbid. A colleague sent me a photo of Middle Fork Tumalo Creek (see Fig. 1), which suggested that there had been a major sediment-producing event somewhere in its watershed. On September 4, I received an email from recently-retired Forest Service employee and intrepid explorer Chris Sabo that reported: "on a hike yesterday, came across impressive earth-moving evidence originating in bowl on north ridge of Broken Top to Crater Ditch." (*see aside on Crater Ditch*).

I thought to myself..."Yesssss. Sounds like we have ourselves a debris flow!" Debris flows and landslides are uncommon on the Deschutes National Forest and around central Oregon in general due to our relatively gentle terrain and because our porous soils (mostly derived from Mt. Mazama pumice or other coarse-textured volcanic ejecta from local sources) do not build up the pore pressures necessary to initiate mass movement.

Crater Ditch is an artificial diversion constructed in 1916 that cuts into the Three Sisters Wilderness. The corridor around the ditch is excluded from the wilderness area to allow for ongoing heavy equipment usage and maintenance of artificial structures. Managed by the Tumalo Irrigation District, it redirects water from Crater Creek (fed by glaciers on the flanks of Broken Top) into Middle Fork Tumalo Creek. This water is diverted again from the mainstem of Tumalo Creek downstream of Shevlin Park to irrigate lands north and east of Bend.

Ever since working on the Olympic National Forest for the summer in 2013, I've been mildly obsessed with them, so it was exciting to have one out my back door.

On the morning of September 5, 2019, I headed out with Kyle Wright, USFS Hydrologist, and Tom Walker, USFS Fish Biologist (retired) to check out the aftermath of this awesome geomorphologic occurrence. We hiked in along Crater Ditch, and immediately noticed diminished flows and significant silt aggradation in the ditch channel (Fig. 2).



Figure 2 - Hiking in along Crater Ditch, Broken Top in the background

Once we reached the Crater Ditch diversion, it was evident that something big had happened—the diversion had been completely blown out and the stream flow largely redirected back into the original Crater Creek channel (see Fig. 3). Very little water was making its way into the artificial ditch. A huge fan of boulders and sediment spread out before us on the valley floor. Heading upstream, we began to see the hallmarks of debris flows – a deeply-scoured channel, boulder levees, and lobed formations at constrictions where material had backed up and then surged forward upon release (see Figs. 4, 5, and 6). At times, the scoured channel was ten to twelve feet deep.

We had an exciting day exploring the channel and chasing its source. Eventually, the day wore on, the slopes became exceedingly steep, and we'd pushed much further up the mountain than we'd said we would in our check-out plans we left back



Figure 3 - Crater Ditch Diversion, pre-debris flow (top) and post-debris flow (bottom); Mt. Bachelor in the background

at the office. Before we turned around, we gazed up at a nearly vertical scree face where a few small rivulets cut into the sediments--and then coalesced, concentrated, and launched the epic debris flow we'd just explored (see Fig. 7). It was an awesome reminder of what can happen when water, sediment, and gravity work in tandem under the right conditions, and that our perceptions of a landscape are just a tiny blink-of-an-eye snapshot of a highly dynamic system.



Figure A - Channel scour with boulder levees. Note the boulders sitting atop the shrub on the righthand side of photo.

Figure B - USFS Hydrologist Kyle Wright stands atop the debris fan near the terminus of the Crater Creek debris flow.

Figure C - Debris flow delivery channel upstream of ditch diversion.

Figure D - Near the debris flow initiation point.

Figure E - Multiple large rills can be seen cutting



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.oss@gmail.com or

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