Ed Landa has been captivated by soils since his undergrad days, but they’ve hardly been his sole fascination. His love of art, history, and storytelling led him to co-edit a book, Soil and Culture, exploring the perception of soil in ancient to modern societies. His professional interests have encompassed mineralogy, toxic waste materials, and the impact of rubber tire-wear particles on soil and water. Now “retired,” he’s still writing and studying; one of his latest works appeared in the last issue of Soil Horizons, in fact. The article’s title begins with “Hooked!” and that pretty much sums up Landa’s career. But he also recently shared some of the details.

Soil Horizons: You started out studying geology and then switched to soil science. What was it about soil science that piqued your interest?

Landa: I was particularly interested in mineralogy. At some point in my junior year at the City College of New York, as part of a class assignment, I came across a 1968 paper in Science magazine on electron microscope studies of the weathering of mica minerals in soils. The work was by Charles Rich at Virginia Tech. Soil—this highly dynamic, low-temperature environment—was new and exciting terrain for me.

That summer, I was able to secure a job on a forest soils research project at the New York State College of Forestry’s Charles Lathrop Pack Forest in the southern Adirondacks. That was the summer of 1969, and besides climbing trees, unplugging irrigation hoses, and learning about nutrient deficiencies in red pine, another vivid memory was watching the Apollo 11 moon landing.

Soil Horizons: What happened next?

Landa: I came back for my senior year, took microbiology and ecology in addition to my geology courses, and applied to grad school in soil science. I had the great privilege to work with clay mineralogist Bob Gast in the soils department of the University of Minnesota. I worked on the mineralogy of iron oxides for my master’s degree, and on a problem related to radioactive waste disposal for my Ph.D. I then did a postdoc in the soils department at Oregon State University, looking at the fate in soils of mercury released from coal combustion.

Soil Horizons: You worked most of your career at the U.S. Geological Survey (USGS) in the Washington, DC area, correct? What kind of work did you do there?

Landa: Yes, I joined the geochemistry research group within the Water Resources Division of USGS in 1978. “The Survey,” as we call it, was home for more than 35 years. My initial assignment was to look at uranium mill tailings, the crushed rock residues left after uranium is removed from ores by chemical treatment—typically hot sulfuric acid. To me, these “soil-like materials,” deposited in ponds that later drained, were soils in the making, subject to the same biological and non-biological processes that form natural soils from parent material.

So I looked at processes such as microbial iron reduction and sulfate reduction that are part-and-parcel of how we think about soil formation. The goal of this mission-oriented research was to assess environmental conditions that could impact the movement of toxic substances from these waste materials and to identify disposal sites that might be problematic.

Soil Horizons: What else did you study?

Landa: In my later years at USGS, my research in collaboration with university colleagues focused on the environmental fate of zinc associated with tire rubber.
We looked at multiple environmental pathways: as tire-wear particles (deposited in roadside soils and storm water ponds) and as combustion by-products (such as stack emissions from industrial operations where scrap tires are used as a fuel). I’m continuing this tire work with colleagues here at the University of Maryland.

**Soil Horizons:** What is the coolest thing you’ve learned about soils?

**Landa:** I can honestly say that cool things are the “gifts that keep on giving” in soil science. So the list is more than one.

This past month’s cool thing was learning about the staining of gastropod shells in soils from Maryland. Here, the shell color is diagnostic of the biogeochemical conditions that controlled iron deposition in the soils.

One from my first year of grad school was seeing “slickensides” in a high clay-content soil. These are polished surfaces that occur along shear planes within shrink-swell soils. I had seen slickensides in rocks within faults—but in soils?—who knew!

![Slickensides form in soils with significant amounts of shrink-swell clays. As the clays expand and contract along cracks, the sides of the fracture are “rubbed” smooth. Photo by J. Kelley and courtesy of Flickr/soil science@nc state.](image)

Although I’ve never worked directly with soil fungi, they remain a source of continuing fascination for me. Their degradation of plant material in soils can be studied by experiments using buried tea bags—Dietrich Epp Schmidt and Stephanie Yarwood in our department are currently collaborating on such a project. Fungal hyphae can act as networks that lead to the rapid lateral movement of ions within soils. They can also drill nearly circular tunnels in soil minerals. Now, who can say that’s not cool?

**Soil Horizons:** Speaking of cool, tell our readers about your book, *Soil and Culture*. How did it come about?

**Landa:** The idea for the book was born in the lobby of the Philadelphia Convention Center at the World Congress of Soil Science in the summer of 2006. At the start of that week, Christian Feller from France was known to me by name only—we were the incoming chair and vice chair of the International Union of Soil Sciences’ Commission on the History, Philosophy, and Sociology of Soil Science. Christian is a student of fine art, fine wine, and history, and a collector of antique books. I enjoy contemporary art and movies. In the coming months, we recruited a cadre of contributors from within and outside soil science, the latter including textile artists, sculptors, poets, geographers, geologists, anthropologists, archaeologists, and wine specialists. What emerged in 2010, in time for the World Congress in Brisbane, was our book, *Soil and Culture*, and an enduring friendship. I have cooked in Christian’s wonderful kitchen, learning to make a pureed leek soup—an unexpected but truly memorable part of our collaboration.

**Soil Horizons:** What are you doing in your “retirement”?

**Landa:** I am an adjunct faculty member in the Department of Environmental Science and Technology at the University of Maryland. I am a firm believer in the power of “place,” and this is a physically and intellectually immersive place for thinking about soils, with monoliths lining the hallways on the way to my office. I am very grateful for the great colleagues and students here. This semester, I am co-teaching a course on the environmental history of Maryland. I continue to do research and have ramped up work on the history of science and technology.

**Soil Horizons:** You’ve been a member of SSSA for nearly 50 years! Do you have any key pieces of advice for the new generations of soil scientists coming after you?

**Landa:** I can think of no better field to be in! There is a niche for every interest and an umbrella that is expansive in its breadth. We are members of a profession that was doing environmental science and biogeochemistry research long before these disciplines were part of the mainstream.

The size of the soil science community is not like that of the big sciences—it has a human scale, and friends you went to grad school with will be among the folks you’ll see and interact with throughout your career. That’s unique. I went to my first SSSA meeting in Tucson within a few months of entering the field and am looking forward to the Minneapolis meeting this year.