Tale of an American Soil Scientist in Canada

Emily M. Clark, CPSS

Editor’s note: Do you have a tale you’d like to share—good or bad—about life as a soil scientist or an experience you’ve had in the field? If so, email it to Dawn Gibas at dgibas@sciencesocieties.org. You may remain anonymous if you like.

In 2009, I made my first trip to the boreal forest in northern Alberta, Canada. My task for this trip, and several to follow, was to complete pre-disturbance assessment soil surveys on behalf of an energy company looking to expand development of an in situ oil sands project. Prior to this trip, my work as a consulting soil scientist had been almost exclusively limited to the southwestern United States. For me, the vast expanse of the basin and range landscape is familiar and the soils predictable. You can see the scale of the landscape in the southwest; the mountains grading into alluvial fans then the basin floor, or the differential erosion of mesas and escarpments. The boreal forest, with its dense vegetation of stunted trees and subtle changes in topography, was like going to a different world. There are no mountains to assist with orientation, and the endless pockets of fens and bogs creates the feeling that you might be moving in circles. During the first few days of my work, I started to wonder if I would become as familiar with the soils of the undulating and hummocky terrain as I am with the soils of the Southwest. All my education and training suggested the answer was yes; however, the landscape wasn’t the only thing I was adapting to. I was required to complete this soil survey in a foreign taxonomy: The Canadian system of Soil Classification.

The Canadian system is similar in structure and organization to Soil Taxonomy as it was strongly influenced by the American system (Soil Classification Working Group, 1998). However, the Canadian system was designed to classify only the soils of Canada; whereas the U.S. system was developed as a comprehensive system of soil taxonomy. The basis for the current Canadian System was outlined in 1955, about the same time as Soil Taxonomy was being developed in the United States in 1931. Although the understanding of pedogenesis is the same in both systems, the definitions of soil horizons and taxa differ from one system to another. The soil orders, horizon designations, and subscripts in the Canadian system were developed to reflect the soil formation of the region, and in general, the Canadian system is a less complex system than Soil Taxonomy. For example, there is no use of epipedons, no suborder level, and there are less than a dozen named diagnostic horizons.

Now, I am no stranger to regional differences in soil descriptions. During my undergraduate career at the University of Arizona, I competed in several regional and national soil judging contests. Soil judging contests provide a unique opportunity for the university student to understand pedogenesis through field experience. Typically, students have the opportunity to travel to a contest held in a different region of the United States with a different setting for soil development. At a regional or national contest, there are several days of practice pits before competition to give the student time to learn about the regional soils and conventions used to describe them. During my first trip to the boreal forest, I was reminded of my soil judging experience and how it would require I adapt to the regional differences. However, as I became more familiar with the Canadian system, I found that some of the differences presented a greater challenge than I was used to.

The Bt and Argillic Horizon

In the arid southwest, I consider most soils to be little clay factories. Parent