

Natural Resources Conservation Service

# Soil and Plant Science Division

Southwest Soil Survey Region



## MLRA Soil Survey Office at Santa Fe, New Mexico

### Valle Vidal Soil Ecology Field Trip

#### Purpose

During the unseasonably warm and dry weekend of October 23rd, a group comprised mostly of graduate students from University of Colorado—Boulder and the University of New Mexico journeyed to the Sangre de Cristo Mountains of New Mexico. There, they participated in a tour of soils, ecosystems, and landscapes of the Valle Vidal in Carson National Forest ([Valle Vidal](#)). The group met at the McCrystal Campground just east of the Valle Vidal (read: “the Valley of Life”) on Friday night. After coffee, bagels, and oatmeal early Saturday morning, they hit the ground running.

#### Background Information

Many non-Land Grant Universities have programs in natural or earth sciences (ecology, environment, or biology) that don't include programming in the agricultural sciences and therefore lack formal soils education. This can clearly lead to a knowledge gap regarding the role soils play as they interact with many disciplines. It is apparent that a great demand exists for soils education in non-agricultural academic applications. At the request of several local university professors, staff from the Santa Fe MLRA Soil Survey Office agreed to host a soil ecology tour to address the need for soils education.



Figure 1.—Students examining a soil profile along a catena roadcut in a grassland savannah segment of a transect. The transect spanned from deep, valley bottom Mollisols to shallow, foothill Alfisols. Students observed how soil properties transitioned along the entire span and how plant community composition and dynamics responded directly as a function of soil characteristics.



Figure 2.—The group visiting a slope wetland complex and discussing the biogeochemical interactions in the soils. The site is instrumented with a piezometer that is currently recording artesian conditions. Hydraulic pressure at depth is visually demonstrated where it forces outflow into an aerial stream of water.





*Figure 3.—A unique cutbank dissected by Comanche Creek, which is a drainageway wetland system. Hydrology concepts visible in this soil profile demonstrate the wetland chemistry through discharge along a riparian terrace. Students were able to see how anaerobic conditions were recorded by mineral precipitates in the soils uphill from the stream.*



*Figure 4.—Attendees getting an introduction to day-to-day NRCS field office operations and functions from MLRA Soil Survey Office Leader Aaron Miller.*

## Key Outcomes

The students were introduced to a variety of soil types across several landscapes within the Valle Vidal. The first part of Saturday was spent examining soil profiles in upland settings. Positions ranged from a foothill-to-valley catena to steep mountain flanks. One of the more notable discussions was on the role of soils in terrestrial carbon sequestration and was led by Dr. Eva Stricker, a professor from UNM.

During the second half of the day, the focus shifted to bottomland soils where hydric soils and wetlands abound in this landscape. Among the landforms visited were a chain of slope wetlands, a histosol in a larger fen, and a cutbank along a riparian corridor. The students were involved in discussions regarding the biogeochemistry of wetlands systems. The discussion was directly related to a recent lecture in one of their soil microbiology classes taught by Dr. Noah Fierer, the professor from CU Boulder.

On Sunday, the instruction centered on tools and resources for accessing information and data about soils and ecosystems. The group hiked to a valley adjacent to the campground. Handouts of soil survey and ecological site descriptions were provided.

Aaron Miller, the soil survey office leader from Santa Fe, delivered a presentation on how to properly use a soil survey and on the MLRA hierarchy and its implications for ecological boundaries. The presentation led to an examination of the current state of information available for the area and the obvious need for future update work. This led to a discussion on the inclusion of multidisciplinary skills to produce effective ecological site descriptions, which was a great segue to a discussion on finding a career path within NRCS. Students are the future of continuing improvement of soil surveys.

## Future Goals/Conclusions

NRCS–SPSD is in need of staff ranging from experienced experts in leadership positions to entry level scientists. The spigot of the academic pipeline seems to have tightened when it comes to grooming applicants for NRCS jobs. Now is a good time to familiarize ourselves with departments across multiple disciplines (not just ag-programs). The desire for soil education seems to be growing, which confirms that the timing is right for us to step in and introduce ourselves.