

Soil and Plant Science Division

Technical Soil Services

South Central Region

SPSD Soil Scientists Educate Second and Third Grade Students in Temple, Texas, about Soil and Soil Survey Equipment

Bryan, Texas, Major Land Resource Area (MLRA) Soil Survey Office (SSO) and South Central Regional Office

Purpose

On April 24th, 2025, staff from the Soil and Plant Science Division (SPSD) South Central Regional Office and Bryan, Texas, MLRA SSO gathered for an educational event with second and third grade students in Temple, Texas (fig. 1). This event assisted Saint Mary's Catholic School by providing firsthand experience to the students with soil survey equipment, allowing them to analyze real life soils collected from past soil survey projects, and teaching them about the importance of healthy soils. The SPSD team of soil scientists prepared and provided relevant and exciting soil survey information to a group of about forty students.

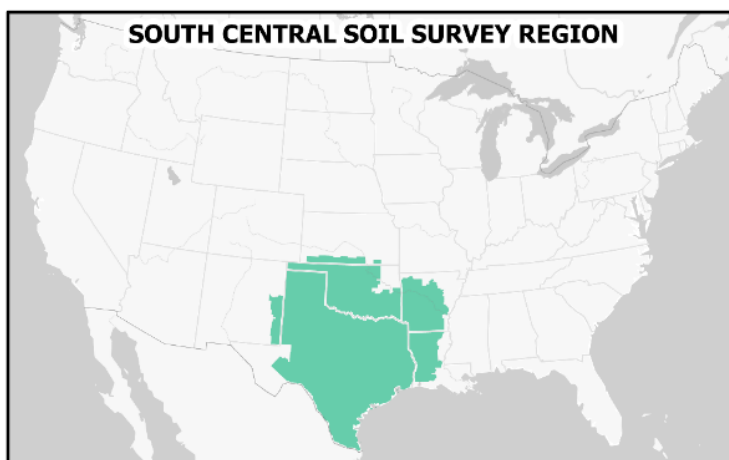


Figure 1.—Extent of the South Central Soil Survey Region, which covers Temple, Texas.

Background

SPSD staff prepared for several exciting sessions for the field day at Saint Mary's Catholic School in Temple, Texas. The senior regional soil scientist at the South Central Regional Office, Roel Guerra, presented the history of soil survey in America. The regional GIS specialist and soil scientist at the South Central Regional Office, Riley Dayberry, talked about rocks and their formation. The Bryan, Texas, MLRA SSO leader, Dr. Beyhan Amichev, demonstrated and talked about diverse types of soil survey equipment that SPSP staff use in collecting the soils shown at this event. The soils included full profiles of Darco (Grossarenic Paleudults) and Padina (Grossarenic Paleustalfs) with contrasting soil layer colors.

Guerra began by presenting the history of soil survey in America, going back 125 years in our past and emphasizing the importance of the work of soil survey staff and how it benefits all of society. He also expanded on the topic of the make-up of the mineral fraction of all soils, emphasizing the different particle sizes by using the analogy of a beach ball, golf ball, and paper hole-punches to compare sand, silt, and clay particle sizes and shapes, respectively.

Dayberry engaged the students in an exciting conversation about rock formation. He talked about what happened millennia ago under high tectonic pressures and temperatures and how, today, we differentiate many types of rocks, including metamorphic, igneous, and sedimentary (fig. 2). He used household materials to show how different rock layers will form through time and how soil formation begins with parent material, which we observe as rocks, and leads to productive soils and their observed properties.

Dr. Amichev continued by emphasizing the importance of soils for food, fiber (clothes), and shelter, leading up to a clear message that the work that soil survey staff does affects everyone in America.

Then it was time to get everyone's hands dirty by learning how to determine the texture of a soil layer by hand (fig. 3). All SPSP staff at the event helped the students learn how to prepare a soil sample for hand texturing. Soil texture is one of the fundamental physical properties used for important soil interpretations regarding soil health, erosion prevention, enhanced nutrient retention, and soil water purification and storage across the landscape. Dr. Amichev also showed the students how to determine soil color with the "Munsell Soil Color Book" using the profiles of Darco and Padina soils (fig. 3).

Lastly, the students observed soil reaction, or pH, and determined the presence of soil carbonates by observing a chemical reaction when a drop of a testing agent contacted the soil and bubbles formed.



Figure 2.—Riley Dayberry talks about rock types and rock formation processes.



Figure 3.—(Left) Roel Guerra (left) and Dr. Amichev (right) demonstrate hand soil texturing. (Right) Dr. Amichev talks about color changes between different soil layers.



Key Outcomes

This year, the staff at the South Central Regional Office and Bryan, Texas, MLRA SSO had a unique and rewarding opportunity to educate young students in second and third grade in Temple, Texas. Preparation for this event included days of logistical planning, coordination, and gathering of materials to engage and captivate the attention of the young students in the most effective ways. There is a difference in presenting soil and soil survey history and equipment information to adults than to younger and more naturally curious groups. By allowing the young students to perform the tasks themselves, it gave them pride in their achieved results. This was the main goal, and it was an amazing field day for all students.

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