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Carbon Literacy and Perceptions in New Mexico

The carbon literacy research led by Dr. Sawssan Boufous, Dr. Brian Hurd, and graduate student Clinton Owusu had several successful oral and poster presentations this year about carbon sequestration and climate change adaptation behaviors. The team has been working on introducing the carbon credit market in New Mexico, and two survey studies that investigate the general population and producers' perceptions on adaptation to climate change.



Graduate student Clinton Owusu attended the New Mexico Research Symposium, Albuquerque, Nov. 15, 2025.

Preliminary results of the surveys suggest that New Mexicans are fully aware of climate change; incentivizing programs that encourage adopting practices that mitigate climate change effects are needed. For more details, a CES article "Assessing Climate Change Perceptions, Knowledge, and Adaptations in New Mexico: A Survey Report" will soon be released.

Publication Highlights

How does carbon respond after irrigation retirement?

As drought intensifies and water demand continues to put pressure on groundwater resources, irrigated acreage is decreasing in the South West. Sustainable farming practices are becoming increasingly crucial to address the issue. However, the future of soil carbon is not known. A study by Sharma et al. (2026) evaluated soil organic carbon with and without cover cropping in crop rotations under full irrigation and irrigation retirement. The study found that mixed cover crops increased soil organic carbon by up to 59% under irrigation and by 25% when irrigation was withdrawn from the land. Additionally, cover crops improved soil microbial health by stimulating beneficial bacteria and fungi. The researchers also evaluated perennial grasses in a non-irrigated system, where carbon storage increased by 26% after two years. Both cover crops and perennial grasses appear play key roles in carbon storage in water-limited farming systems. For more details: [Sharma et al., 2025. Microbial community responses to alternative management regulate soil organic carbon storage in agroecosystems experiencing irrigation retirement. Agriculture, Ecosystems & Environment.](#)

Metal-modified biochar improves soil health and crop yield

Metal-modified biochars show promise for improving soil health and crop performance in semi-arid cropping systems. By enhancing nutrient retention, increasing soil biological activity, and reducing nutrient losses, these biochars enhanced soil health. A recent study (Frene et al., 2025) at Clovis Science Center found that biochars modified by adding metal ions reduced soil phosphorus and sulfur leaching by 65% and 50%, respectively, compared to soil without biochar. Specifically, iron-modified biochar enhanced phosphorus use efficiency (PUE), increasing shoot PUE by 77% and root PUE by 40%. These changes also led to an increase in sorghum yield, with sorghum grain increasing by 10–27% and biomass by 5–15%, compared to no biochar control, with the iron-biochar providing the largest benefits, possibly due to its effect on soil pH. Modified biochars can enhance soil health, nutrient use efficiency, and crop productivity in semi-arid cropping systems. For more details: [Frene et al., 2025. Enhancing soil health and phosphorus use efficiency with modified biochar amendment. Science of the Total Environment.](#)

Dr. Pratima Poudel to Lead NMDA Carbon Management Project

We are excited to welcome Dr. Pratima Poudel to our Carbon Management team. Dr. Poudel brings years of experience in residue decomposition, soil health, and biogeochemistry. She will lead our efforts to understand soil health dynamics in lands facing irrigation retirement. This NMDA-funded project evaluates multiple strategies to improve soil health, enhance carbon sequestration, and increase forage production following the transition from irrigated to dryland agriculture.



NMSU Carbon Center Highlights Research at CANVAS 2025

The 2025 CANVAS Conference—the combined annual meeting of the American Society of Agronomy, the Crop Science Society of America, and the Soil Science Society of America—was held in Salt Lake City, Utah, from November 9–12. The event brought together scientists, professionals, and students from across the U.S. and abroad.

Researchers and students from the NMSU Soil Health and Carbon Management Center delivered more than ten oral and poster presentations, showcasing the center's expanding efforts in soil-health and carbon-management research across New Mexico. Topics presented included soil health, greenhouse gas and carbon dynamics with soil amendments, cover cropping, circular grass buffer strips, rangeland systems, optimizing soil health assessment, and model simulations to enhance soil carbon storage in water-limited regions.



Wishing you a joyful holiday season, and may the coming year 2026 bring you happiness, fulfillment, and countless moments of joy!

Congratulations Graduates



Piumi Madhuwanthi Sangam Panta

Olufemi Adebayo

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The College of Agricultural, Consumer and Environmental Sciences is an engine for economic and community development in New Mexico, improving the lives of New Mexicans through academic, research, and Extension programs.