

EASTERN NEW MEXICO UNIVERSITY

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Water, Agriculture and Energy Research at ENMU

Dr. John Montgomery

Associate VP for Research and Graduate School Dean

September 23, 2025



Presentation to the NM Science, Technology and Telecommunications Committee

September 23, 2025

Mesalands Community College



Eastern New Mexico University: Mission

- Eastern New Mexico University combines a traditional learning environment with 21st century technology to provide a rich educational experience.
- Eastern emphasizes liberal learning, freedom of inquiry, cultural diversity and whole student life.
- Excellent teaching and active learning define campus relationships. Scholarship, both primary and applied, cultural enrichment, and professional service are also important contributions of the University community.

Why Research/Scholarship?

- ENMU is a regional, Masters-level, comprehensive university
- There is a balance of teaching and scholarship
- Scholar/Teacher model expands opportunities



New Mexico Research

- New Mexico EPSCoR
 - ‘Established Program to Simulate Competitive Research’
 - Funded by NSF
 - Build NM capacity to conduct research
- New Mexico INBRE
 - “IDeA Networks of Biomedical Research Excellence”
 - Funded by the National Institutes of Health
 - Build national multi-disciplinary research network to enhance biomedical research with scientists, educators and students

New Mexico Research

- New Mexico WRRRI
 - New Mexico Water Resources Research Institute
 - Develop and disseminate knowledge that will assist the state and the nation in solving water problems
 - Established in 1963 (NM Legislature)

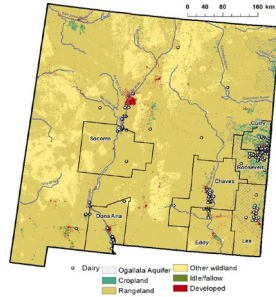
Water, Agriculture and Energy

- Department of Agriculture, Food Science, and Kinesiology
 - Department of Anthropology and Applied Archaeology
 - Department of Biology
 - Department of Physical Sciences
-
- Undergraduate and graduate students

Water

- Wastewater remediation
- Inexpensive ways to remove contaminants from water
- Assess damages from recent wildfires

Water and Energy



(Dell, C.J., et. al., *J. Environ. Qual.* 2022, 51, 521)



- New Mexico is ranked 9th and 4th in the nation for milk production and cheese production, respectively. But dairies in New Mexico generate almost 6.4 million gallons of manure daily, leading to contaminated groundwater with excess nitrogen
- ENMU developed a natural research site to study how to turn the wastewater into green energy and high-value products in a cost-effective and environmentally sustainable manner
- Dr. Yan used an algal scrubber to remove contaminants as proof of concept: “Leveraging the established outdoor, pilot-scale dairy wastewater remediation system, we propose to monitor the algal growth dynamics in real time and study the algal–microbial community at a molecular level. The study allows us to better engineer the system for ecosystem services and rural bioeconomy development.”
- Established an industrial partnership with the Moonstone Dairy, Dairy Farmers of America, and Southwest Cheese Co., LLC.; Collaborated with Los Alamos National Laboratory and Pacific Northwest National Laboratory. Graduated 5 MS in Chemistry students and trained 20+ undergraduate students for research. Published a peer-reviewed paper and gave 10+ oral presentations at national and international research conferences.

Water

Omale Ogbe's Pursuit of Clean Water and Cancer-Fighting Solutions



“Extraction of uranium from water using a water-insoluble organic compound”

Acknowledgement: This work was funded by a 2024-2025 NM WRRRI Student Grant funded by the New Mexico State Legislature

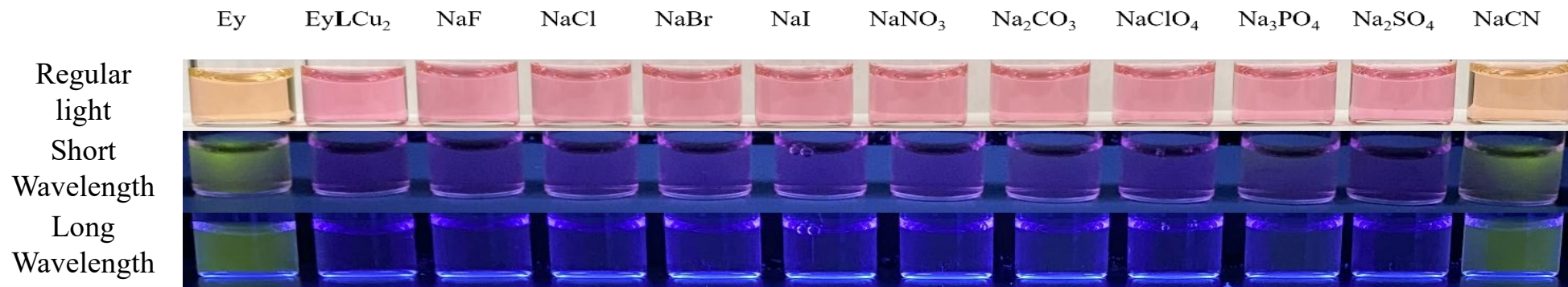
Mathew Omale Ogbe will graduate with a Master of Science in Chemistry in December 2025.

Water

Enrique Martinez: Pursuit of Clean Water

“Synthesizing Di-Nuclear Metal Complexes and Application for the Detection of Cyanide in Water”

Acknowledgement: This work was funded by a 2023-2024 NM WRRRI Student Grant funded by the New Mexico State Legislature. Enrique Martinez graduated with a Master of Science in Chemistry in December 2024. He is an Environmental Analyst at Eurofins Environmental Testing Center.



Water

Developing Projects:

Gifty Dudzilah (Chemistry)

Study of the removal of Uranium with base-treated water insoluble organic compounds

DennAsia R. Cordova (Chemistry)

Study of the removal of fluoride from city water using biocompatible (eg, eggshell, hay, animal bone) materials

Water and Agriculture

Reminder: Student Water Research Grant Proposals Due Tomorrow, September 16, 2025

The New Mexico Water Resources Research Institute will be accepting Student Water Research Grant proposals through **Tuesday, September 16, 2025, by 5:00 PM MT.**

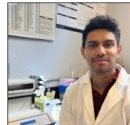
Please send all proposal submissions via email using the subject line: "2025-2026 NM WRRRI Student Grant Proposal" to Carolina Mijares at mijares@nmsu.edu

These grants are intended to help students initiate research projects or supplement existing student research projects in water resources research to improve water understanding and management in New Mexico. All student researchers (undergraduate, masters, or doctoral students) enrolled in a degree program at a New Mexico-based public higher education institution are eligible to apply.



AMANDA HINTON, ENMU

[Click here for grant guidelines](#)

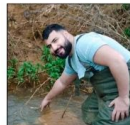


DULITH RAJAPAKSHE, NMSU



RHETT SANDERS-SPENCER, UNM

**Proposals Due:
September 16, 2025
by 5:00 PM MT**



AHMAD EZZ AL DINE, NMT

[Note: Photos highlight a few recipients of the FY24-25 Student Water Research Grants]

Amanda Hinto is a mother, a first-generation student, now a scientist, and a daughter of New Mexico.

Amanda Hinton's research project focused on remediating toxic heavy metals, like those left behind in fire-damaged soils. The 2022 Hermit's Peak and Calf Canyon wildfires occurred close to her family's ranch.

Faculty from the Department of Agriculture, Food Science and Kinesiology, and the Department of Biology are collaborating and assisting Amanda's research.



Agriculture

Developing Projects:

Kweso Boafo (Biology and Agriculture)

Microbiome of Liver Abscesses In Cattle from the High Plains of Texas Panhandle: A Comparative Study

Morgan Miller (Agriculture and Biology)

Effects of Spent Coffee Ground Consumption on Sheep (*Ovis aries*) hormones

Agriculture



Sajan KC graduated from Eastern New Mexico University in 2023 with a Master's in Biology.

He is currently attending school at the University of Florida, in their Department of Entomology.

At ENMU, Sajan has studied about 1,000 specimens of beetles, which had 59 total species; 29 of those were new to science!

He has recently named a few of his new beetle species after the famous Netflix show *Breaking Bad*.

Energy

- Department of Energy awarded Dr. Yan to research carbonyl to distinguish different levels of energy
- Dr. Yan's students are evaluating different types of solar cells to enhance energy transmission and/or longevity
 - Clinton Arthur, "Synthesis of Di-Carbalddehyde-Functionalized Ladder-Type Tetra(*p*-Phenylene for Organic Solar Cell Applications
 - Rukayat Hassan, "Synthesis of Mono-Carbonyl-Terminated Tetra(*p*-Phenylene) for Probing Electron Delocalization

Energy

- Dr. Rhaman: Catalytic Reduction of Carbon Dioxide with Manganese Complexes
- This work was supported by the U.S. Department of Energy, Office of Science, Office of Workforce Development for Teachers and Scientists (WDTS) under the Visiting Faculty Program (VFP)



Thank you!

- Questions?