

SSAE Newsletter

AUGUST // 2024

VOLUME 4.5



// ABOUT

The Strategic Systems Analysis and Engineering (SSAE) directorate provides the decision science and analysis capabilities necessary to evaluate complex energy systems. The directorate's capabilities address technical, economic, resource, policy, environmental and market aspects of the energy industry. These capabilities are critical to strategic planning, direction and goals for technology R&D programs and the generation of market, regulatory and technical intelligence for NETL senior management and DOE. SSAE offers a range of multi-criteria and multi-scale decision tools and approaches for this support:

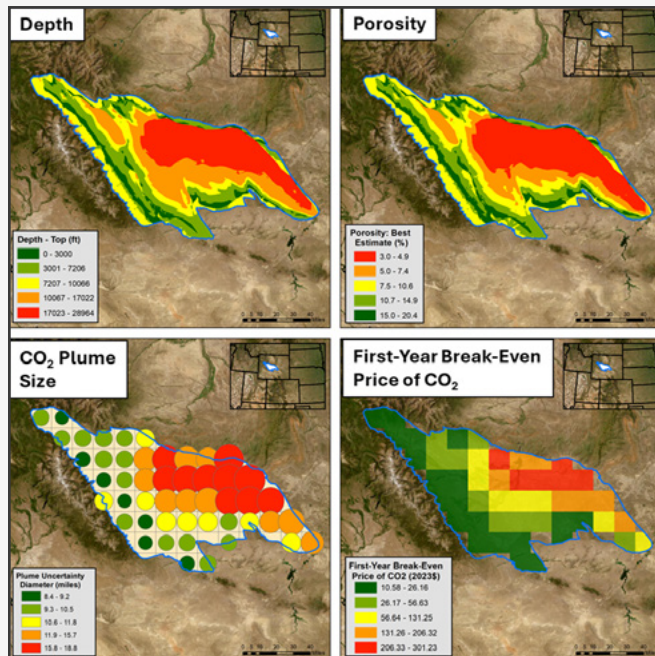
- Process systems engineering research: advanced modeling, simulation and optimization tools for complex dynamic systems
- Process and cost engineering: plant-level synthesis, process modeling and simulation of energy systems with performance estimates
- Resource and subsurface analysis: evaluation of technologies, approaches and regulations for subsurface energy systems and storage
- Market and infrastructure analysis: economic impacts and program benefits
- Environmental life cycle analysis: cradle-to-grave emissions and impacts

These tools and approaches provide insights into new energy concepts and support the analysis of energy system interactions at the plant, regional, national and global scales.

// HIGHLIGHTS

GEES Geodatabase Provides Detailed Characterization of Saline Storage Formations

SSAE has developed and published the [Geoanalytical Evaluation of Saline Storage \(GEES\) Geodatabase](#) – a publicly available geodatabase that characterizes the unique geologic parameters of saline formations that are critical to the development of carbon storage across the lower-48 U.S. states. The high-spatial-resolution dataset (up to 5-kilometer grid spacing) covers 57 prospective saline storage formations present in the [FECM/NETL CO₂ Saline Storage Cost Model \(CO₂_S_COM\)](#) from California to the East Coast. It was derived from publicly available sources. Data captured on a per-formation basis include depth, thickness, lithology, pressure, temperature, depositional environment, salinity, porosity, permeability, structural regime and fracture pressure. The dataset includes spatially discrete estimates of CO₂ plume sizes and the estimated first-year break-even price of CO₂ storage (see exhibits below for the Tensleep Formation in the Wind River Basin). Given the nature of this dataset, it can facilitate more accurate carbon storage-related pursuits such as storage resource potential evaluations or CO₂ injection cost estimation during early stages of project development. This newly released database, developed by SSAE researchers Austin Mathews*, Jeffrey Eppink*, Dave Morgan and Tim Grant, is available for download [here](#). An [overview of the database](#) that was presented at the 2023 FECM / NETL Carbon Management Research Project Review Meeting is available [here](#).

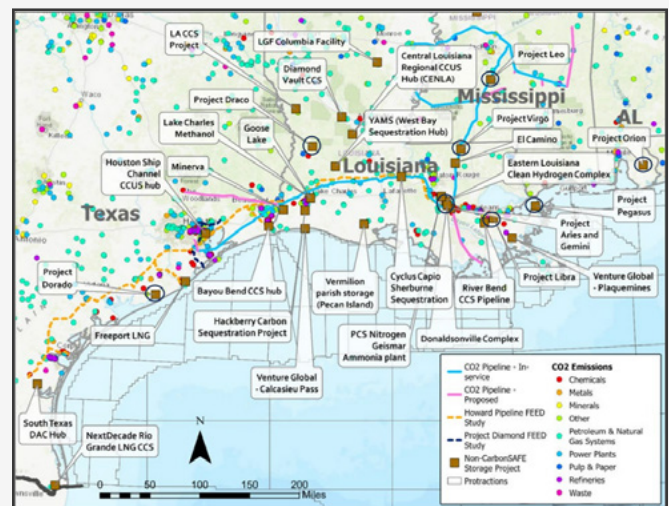


Tensleep Formation, Wind River Basin

OTC Paper Highlights CCS Opportunities in Gulf Coast Region

In association with the [2024 Offshore Technology Conference \(OTC\)](#), SSAE recently published a paper titled “[CCS Opportunity Along the Gulf Coast Corridor](#)” that provides an overview of Gulf Coast Corridor carbon capture and storage (CCS) potential, as well as the burgeoning industry in the region. Given the abundance of emissions point sources (~1,000) and the proximity to high-quality storage reservoirs, some 43 planned projects have sprung up in the region. This includes both onshore and offshore projects, with many being financially supported by NETL and DOE as shown in the Gulf Coast Region Announced CCS Projects and Emission Sources figure below.

The tools developed by FECM/NETL, including the [FECM/NETL CO₂ Saline Storage Cost Model](#), FECM/NETL Offshore CO₂ Saline Storage Cost Model (planned release 2024), [FECM/NETL CO₂ Prophet Model](#), [FECM/NETL CO₂ EOR Cost Model](#), FECM/NETL Onshore CO₂ EOR Evaluation Tool (planned release 2024) and the [FECM/NETL CO₂ Transport Cost Model](#), have already been used for various assessments of carbon transport and storage economics and feasibility throughout the U.S. and could be a valuable resource to industry stakeholders evaluating future opportunities in the Gulf Coast Corridor. The region’s impressive CCS-related resources coupled with newly enhanced 45Q tax incentives will likely lead to a bright future for the Gulf Coast Corridor’s CCS industry. The paper was coauthored by SSAE researchers Tim Grant, David Morgan, Luciane Cunha, Taylor Vactor* and Hannah Hoffman* with accompanying conference presentation by Tim Grant and is available [here](#).



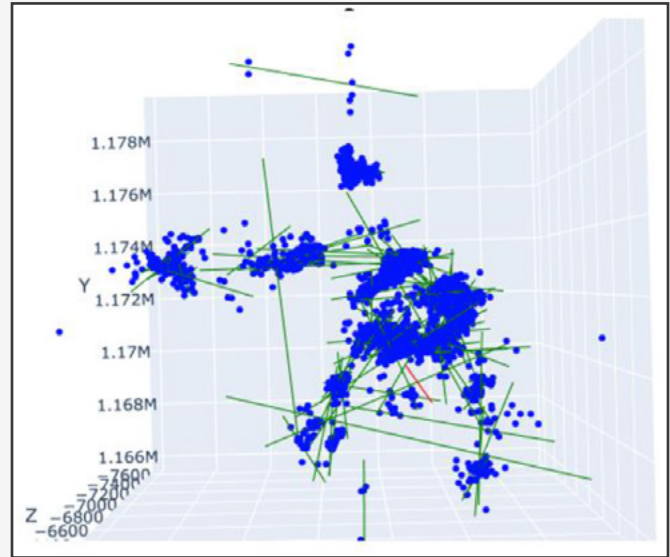
Gulf Coast Region Announced CCS Projects and Emission Sources

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SSAE Paper Summarized in JPT "Best of the Best"

The Journal of Petroleum Technology (JPT) highlighted a paper presented by SSAE researcher Guoxiang (Gavin) Liu on a machine learning application CCUS-based study that is part of the Science-Informed Machine Learning for Accelerating Real-Time Decisions in Subsurface Applications (SMART) Initiative. The study's fracture network orientation results, using the study's innovative technology of multiple-level analysis, are shown in the figure. The summary article [Machine Learning Provides Fracture Analysis, Mapping for CCUS](#), published in the JPT's February 2024 issue, is a synopsis of the [Machine Learning Application for CCUS Carbon Storage: Fracture Analysis and Mapping in the Illinois Basin](#) paper that was presented at the 2023 SPE Annual Technical Conference and Exhibition held in San Antonio, Texas October 16-18, 2023.

Fracture network mapping has also been demonstrated in Hydraulic Fracturing Test Site (HFTS) Phase I datasets along with two publications [Machine Learning Applications for a Qualitative Evaluation of the Fracture Network in the Wolfcamp Shale Using Tracer and Completion Data](#) presented at the SPE/AAPG/SEG Unconventional Resources Technology Conference, Houston, Texas in July 2021 and [Multi-Level of Fracture Network Imaging: A HFTS Use Case and Knowledge Transferring](#) presented at the SPE/AAPG/SEG Unconventional Resources Technology Conference, Houston, Texas, in June 2022. The technology can also be deployed to other energy subsurface fracture system characterization and monitoring such as hydrogen storage and geothermal explorations. This study was conducted by NETL researchers G. Liu, A. Kumar*, W. Harbert*, H. Siriwardane, D. Crandall, G. Bromhal (HQ) and Luciane Cunha.



Fracture network orientation (green lines) as determined using the study's unsupervised machine learning algorithm



Staff Spotlight

Since joining in November 2022, **Elmira Shamlou** has been supporting SSAE's Process Systems Engineering team at NETL Pittsburgh in the design, analysis, and optimization of water treatment, valorization, and management systems. She has been involved in the Produced Water Management Optimization Initiative ([Project PARETO](#)), contributing to the modeling of produced water treatment and beneficial reuse.

Additionally, within the Water Technoeconomic Assessment Platform ([WaterTAP](#)), she is developing models for thermal and membrane-based systems, such as membrane distillation. Recently, her work has expanded to the Process Optimization Modeling for Mineral Sustainability (PrOMMiS) project, focusing on electrochemical processes.

Elmira completed her bachelor's and master's degrees in mining and mineral engineering and an MBA at the University of Tehran, where she graduated with a Brilliant Talent Award.

During her master's studies, she worked on the process modeling and optimization of mineral processing plants. She then pursued her Ph.D. in Civil and Environmental Engineering at the University of Pittsburgh, working extensively on the process modeling and optimization of desalination technologies, ranging from membrane-based to thermal-based systems. She also contributed to multiple water resource engineering projects during her Ph.D. studies.

After graduation Elmira worked as a postdoctoral researcher for a year at the University of Pittsburgh, where she was involved in quantifying the flaring of natural gas associated with unconventional oil and gas production and modeling monomer recovery from recycled plastics projects.

Elmira looks forward to contributing to various projects at NETL.

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SSAE's Peter Balash – Part of Leadership Roundtable at Carbon Capture Technology Expo

SSAE's Associate Director Peter Balash was invited to be part of the [Leadership Roundtable: Regulation of CO₂ Storage in North America: Managing Risk and Ensuring Compliance with Permits and Licenses](#). The roundtable was in the new Strategic Forum track at the [Carbon Capture Technology Expo](#) that was held June 26-27, 2024 at the NRG Center in Houston, TX. Discussions were held about the status of CO₂ storage regulations, the technical and liability risks of various permitting programs and licensing frameworks, and how regulating agencies might promote the most efficient rulemaking for the advancement of CO₂ storage resource development. The other [roundtable leaders](#) were Andrew Duguid, Vice President at Advanced Resources International, Inc., Adam Green is Policy and Regulatory Manager at Worley and Gavin Dillingham is the Executive Advisor for Government Affairs at SLB. [Learn more](#).



Peter Balash

Associate Director, Strategic Systems Analysis and Engineering, US DOE/NETL



Leadership Roundtable: Regulation of CO₂ Storage in North America: Managing Risk and Ensuring Compliance with Permits and Licenses



Andrew Duguid

Vice President
Advanced Resources International, Inc.



Adam Green

Policy and Regulatory Manager
Worley

**NRG Center
Houston, TX
June 26-27, 2024**



Gavin Dillingham

Executive Advisor
Government Affairs, SLB.

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So Long to SSAE's Tim Grant, It's Been Good to Know You

Congratulations and all the best to SSAE's Tim Grant on his retirement. He has made significant contributions to NETL in subsurface resource appraisal, especially for CO₂ storage. Tim joined NETL initially to support the Strategic Center for Natural Gas & Oil and then transitioned to the Office of Systems Analysis and Planning (OSAP), the predecessor organization to SSAE. Tim and Dave Morgan led the development of NETL's economic tools for estimating the cost of carbon transport and storage in the US, including the [FECM/NETL CO₂ Saline Storage Cost Model](#), FECM/NETL Offshore CO₂ Saline Storage Cost Model (planned release 2024), [FECM/NETL CO₂ Prophet Model](#), [FECM/NETL CO₂ EOR Cost Model](#), FECM/NETL Onshore CO₂ EOR Evaluation Tool (planned release 2024), and the [FECM/NETL CO₂ Transport Cost Model](#).

Prior to joining NETL, Tim gained experience in exploration and production in the oil and gas industry as a geologist for Amoco and Figgie International for nearly 15 years. He also has several years offshore experience as a wellsite geologist for [Mobil's offshore operations in Lagos, Nigeria](#). Tim also taught physical geography and environmental studies part-time at Cuyahoga Community College and the University of Phoenix. Tim has MA degrees in economics from the University of Akron, international business from the Thunderbird School of Management and geology from Kent State University. He earned a BA in geology/earth science from Theil College.

When asked what he would do in retirement, Tim replied, "Whatever I want."



NETL's new employees tour the Pittsburgh onsite research facilities. Pictured, from left to right, are Tim Grant, Charles Miller, Wolfe Huber, Ralph Nine, Sam Taylor, Michael Reed, and Mike Nowak, November 2004.

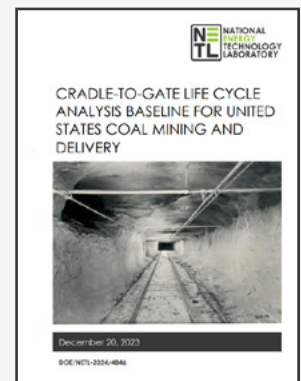


Dinner during an offshore meeting in Houston, pictured left to right: Travis Warner*, Don Remson, Chung Yan Shih, Derek Vikara*, Tim Grant, Chris Nichols, Justin Adder and Merrill Stypula*, October 2019.

Coal Baseline LCA Report

The [Cradle-to-Gate Life Cycle Analysis Baseline for United States Coal Mining and Delivery](#) report assesses the environmental impacts from upstream coal production to its delivery at a power plant. The study characterizes different coal basins, coal types, and mine types used to produce electric power in the North American Electric Reliability Corporation (NERC) regions in the United States using a functional unit of 1 kg of coal. The boundary of this study includes underground or surface extraction, water use at the mine, ventilation, coal handling, coal cleaning, mine tailing disposal, and transportation via conveyer belt, truck, ocean vessel, barge, and train.

The results of the study do not determine preferability of one coal compared to another, but rather offer context for the service to society (e.g., electricity production, carbon fiber production) to determine relative preferabilities. The study was conducted by SSAE researchers Ashley Cutshaw*, Derrick Carlson*, Megan Henriksen*, Michelle Krynock, Matthew Jamieson, and Robert James III.



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SSAE researchers contribute to NAWI workshop at University of Arizona



The National Alliance for Water Innovation ([NAWI](#)) hosted a workshop at the University of Arizona May 21-22, 2024, in Tempe, Arizona (UA). SSAE researchers Tim Bartholomew and Alison Fritz participated in the workshop to identify research priorities for advancing brackish water desalination that NAWI could focus on in the next 5 years (2025-2029).

Tim and Alison contributed background information and oral presentations that featured the [WaterTAP](#), a software tool developed by NETL and colleagues at Lawrence Berkeley National Laboratory, the National Renewable Energy Laboratory, and Oak Ridge National Laboratory. [Learn more.](#)

Training was provided to 15 students and postdocs on how to use WaterTAP by SSAE researchers Adam Atia*, Elmira Shamlou*, and Chenyu Wang* along with researchers Kurban Sitterley and Zachary Binger from the National Renewable Energy Laboratory (NREL). The workshop also included a course on bench- and pilot-scale water treatment systems, provided by UA experimentalists.

In addition to training, the workshop established a stronger connection between WaterTAP and UA. This connection lays the groundwork for combining the capabilities of WaterTAP modelers and UA experimentalists for future funded work. Notably, there will be funding opportunity announcements from the NAWI for water treatment pilots with modeling support starting in 2025 and 2026.

A significant outcome of the workshop was that multiple attendees, spanning academia and industry, were interested in collaborations using WaterTAP including Colorado School of Mines, New Mexico State University, Carollo Engineers, and Xylem.

Amanda Harker Steele – A Prestigious West Virginia Young Leader

SSAE Research Economist Amanda Harker Steele was honored at [The State Journal and WV News Generation Next 40 Under 40](#) celebration at the Robinson Grand Performing Arts Center in Clarksburg, West Virginia June 19, 2024. The award recognized Amanda as a young professional who excels in her field and demonstrates a strong commitment to West Virginia.

Since joining SSAE, Amanda has applied her skills to support projects aimed at building a viable energy future that ensures America's historic power-producing communities are not left behind as the nation transitions to clean energy. [Learn more.](#)



Amanda Harker Steele was honored at The State Journal and WV News Generation Next 40 Under 40

SSAE's Guoxiang (Gavin) Liu receives multiple speaking invitations

SSAE Senior Reservoir Engineer Guoxiang (Gavin) Liu was invited by Rock Fluid Dynamics to be a distinguished speaker at its [Navigator 2024 Technology Summit](#), May 10, 2024, Houston, Texas. Gavin virtually presented [A Case Study of Risk Considerations for Transitioning CO₂-EOR Field to Dedicated CO₂-storage](#). This is part of the work Gavin presented at the 2024 CCUS Conference.

Liu was also invited to be a guest speaker at the [5th Annual Appalachian Basin Geophysical Symposium](#) June 4, 2024 in Pittsburgh. Gavin presented findings from the study [Unconventional Wells Interference: Supervised Machine Learning for Detecting Fracture Hits](#) published in the Journal of Applied Sciences in March, 2024 and conducted by researchers G. Lui, X. Wu (DEVCOM) and V. Romanov.

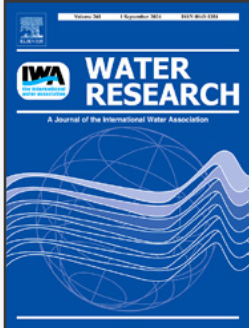
SSAE Participates in the Clearwater Clean Energy Conference

The [48th International Technical Conference on Clean Energy](#) was held June 16–19, 2024 in Clearwater, Florida. SSAE researchers made 10 presentations and moderated a panel on Technology: Demonstrations, Pilot Plant, and Installation Projects. The conference organizers will publish the conference manuscripts in a Special issue of [International Journal of Energy for a Clean Environment \(IJECE\)](#) after peer review of the papers.



Some of the SSAE staff who participated in the Clearwater Clean Energy Conference held Clearwater Beach, Florida. June 16–19, 2024. Pictured, left to right, Sydney Hughes*, Sally Homsey, Ben Ormell, Indra Bhattacharya, and Miguel Zamarripa-Perez*.

TEA Leverages WaterTAP



A paper presenting a comprehensive technoeconomic assessment of a conventional high salinity desalination technology was recently published in [Water Research](#). The assessment utilizes the cost optimization and modeling capabilities of [WaterTAP](#), a software tool led by NETL. SSAE's Process Systems Engineer, Tim Bartholomew, is a coauthor of the paper, [Component innovations for lower cost mechanical vapor compression](#), with Carson Tucker (Stanford), Alex Dudchenko (SLAC) and Meagan Mauter (Stanford).

SSAE Team Visits Pennsylvania Mining Complex

Seven SSAE team members visited [Consol Energy's Pennsylvania Mining Complex](#), in Greene and Washington counties in Southwestern Pennsylvania. Consol operates the largest underground coal mine complex in North America, which is home to one of the largest coal processing facilities in the world. The complex consists of the Bailey, Enlow Fork and Harvey mines.

The SSAE team went underground to the Harvey mine, which has one longwall unit and four continuous mining sections with an average annual production capacity of 5.5 million tons of thermal and high-volume metallurgical coal. After returning to the surface, the team visited the centralized coal processing facility, which washes and processes up to 8,200 tons of coal per hour. The visit also involved a stop at the complex's train loadout facility, which can load up to 9,000 tons of coal per hour across ten unit trains per day.



SSAE team geared-up for underground tour of Consol's Harvey Mine. Pictured, left to right, Miguel Zamarripa-Perez*, Ben Omell, Anthony Burgard, Markus Drouven, Travis Shultz, Amanda Harker-Steele and Justin Adder.

SSAE Hosts Mickey Leland Scholars



SSAE welcomed three [Mickey Leland Energy Fellowship \(MLEF\)](#) students this summer – Sadie Levin, Olivia Sward and Nathan Brown.

MLEF is a highly competitive ten-week program for students in science, technology, engineering and math majors and providing scholars the unique opportunity to gain direct research experience with carbon management/resource sustainability at various DOE national laboratories.

Sadie Levin worked with SSAE's Chad Able and Alison Fritz on "An Investigation of the Impact of Pricing Variation on the Economic Value of Critical Materials in Energy Wastewaters." Previously, data was collected on the prevalence and concentrations of critical minerals in various energy wastewaters. However, the material specifications and market variability that determine the value of these minerals has not been well characterized. This project will involve a study of the variation of pricing data on critical materials for energy ("the electric eighteen") by purity/final product, over time, and by region. Statistical methods were developed to understand how to represent this variation effectively.



Olivia Sward worked with research economist Amanda Harker-Steele on "Using Risk Theory to Determine the Demand for Insurance across the U.S. Bulk Power System." Risk describes any economic activity in which there are uncertain outcomes. Extreme weather events (e.g., February 2021 Texas Deep Freeze), natural

disasters, (e.g., wildfires, tornados) and cyber security threats each pose great risk to the reliability and resiliency of the bulk power system (BPS). The purpose of this project was to identify and describe options for insuring against such risks, noting that options might change during the stages of power generation, transmission, and distribution.

Secondary project objectives included analyzing how the reliability of a specific operating region has changed over the last decade and if results suggest it has been adversely impacted, identifying possible insurance options for the region.

Olivia is a third-year student at the University of California, Berkeley. She is pursuing a double major in Environmental Science and Environmental Economics and Policy. She helps lead a campus group that teaches Environmental Justice lessons at local elementary schools. Additionally,

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she enjoys bringing sustainability to new sectors through her environmental consulting club. Olivia has prior research experience studying the impacts of climate change on marine ecosystems at Northeastern University. In her free time, she enjoys hiking, camping, and live music.



Nathan Brown worked with John Brewer to explore the "Viability of Transporting Both Carbon Dioxide and Hydrogen Gas in Existing Pipelines." Their work was in support of the United States decarbonization. The extensive natural gas pipeline network currently installed throughout

the nation can be an important tool. Using an open-source computational fluid dynamics program, Nathan investigated the transport of carbon dioxide (CO₂) and hydrogen (H₂) in various pipeline configurations to determine what modifications would be needed to successfully convert from natural gas to alternative fluids.

The two main challenges presented by CO₂ and H₂ are the increase in molecular mass from CH₄ to CO₂ and the ability of hydrogen gas to dissociate into individual hydrogen ions and diffuse through solid metal. In the first case, the increased mass and viscosity of CO₂ requires more effort to transport, likely needing equipment upgrades at compression stations. In the latter case, while lower pressures are needed to transport hydrogen, losses will occur regardless of material composition and increase proportionally with pipeline pressure. The project required extensive research into the fluid properties of CO₂ and H₂ and learning the open-source CFD package, [OpenFOAM](#). The long-term goal of the project is to develop an automated digital twin program that can advise pipelines on potential conversions for their unique infrastructure. Developers can then consider carbon capture and storage projects located along the existing pipelines, aiding in the FECM goal of net-zero carbon emission.

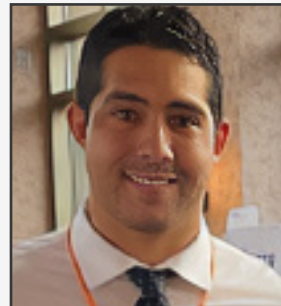
Nathan is a recent graduate of the University of Utah where he studied mechanical engineering and will be attending Texas A&M University at College Station this fall to study nuclear engineering. He completed a Science Undergraduate Laboratory Internship (SULI) last summer at Brookhaven National Laboratory (BNL) where he investigated a design for a novel nuclear power reactor. He hopes to continue this line of study during his graduate work to improve small modular nuclear reactor designs and non-standard operational stability. Nathan wants to help make the grid of tomorrow: a network of nuclear, geothermal, solar, wind, and hydrogen capable of providing reliable energy 24/7 to all sectors. Nathan

and his wife Kiera met through [sabre \(fencing\)](#) when they were 12 years old, and they have a two-year-old Samoyed puppy named Anastasia.

The program culminated in the 2024 MLEF Technical Forum, in Pittsburgh, Pennsylvania August 5-8, 2024, where students presented their work. Video recordings are available [here](#).

SSAE Hosts NNSA-MSIIP and DOE OMNI Summer Interns

SSAE hosted four summer interns through the NNSA-MSIIP and DOE OMNI programs. Diego Gonzalez, Jeffrey Nguyen, Saif Qawasmeh and Dylan Vaughn joined SSAE under the mentorship of Senior Reservoir Engineer Guoxiang Liu, on the [Laboratory Directed Research and Development \(LDRD\)](#) project "AI/ML-Powered Transferable Framework for CO₂-Stimulation Techniques in Geothermal Enhancement (CS-GE2)" part of the [Science-based Artificial Intelligence and Machine Learning Institute \(SAMI\)](#). Work included data collection and quality assurance/quality control (QA/QC), geophysical analysis, machine learning, and visualization and tool platform development.



Gonzalez's work focused on data collection and quality checking as well as use of artificial intelligence (AI) and machine learning (ML) models to improve the conductivity understanding of geothermal reservoir for CO₂ enhanced recovery for clean geothermal energy applications.

Gonzalez is a senior at the University of Texas at El Paso, pursuing a second degree in computer science. He already has a degree in business finance. Diego has research experience using computer vision to predict the particle size distribution of hollow polymer microspheres inside syntactic foams and aims to apply his ML skills into predicting geothermal well characteristics, specifically CO₂ stimulation mappings.



Nguyen worked on providing inputs of earth science and geoscience, especially the geology and related geophysical engineering for the CS-GE2 geothermal project. He participated in support of the analysis of seismology and seismic data to map the fracture network with data from the Frontier Observatory for

Research in Geothermal Energy (FORGE) project for the LDRD CO₂ stimulated geothermal energy enhancement study.

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Nguyen finished a bachelor's degree in physics with a specialization in earth sciences at the University of California San Diego.

He conducted an independent research project in seismology with the guidance of Professor Wenyuan Fan. Seismic array analysis was used to investigate a man-made explosion in the Baltic Sea. In his spare time, Jeffrey plays old-time fiddle music.



Qawasmeh's research focused on machine learning model development with multiple datasets, multiple algorithms, and multiple metrics for CO₂ stimulation geothermal energy enhancement study.

Qawasmeh is a second-year Ph.D. student at North Carolina A&T State

University (NCAT) majoring in information technology (IT). He holds a master's degree in IT and an undergraduate degree in computer science. Saif's main research interest is in cybersecurity and machine learning (ML), and he is a research assistant at NCAT where he works on multiple projects related to studying users' malicious behavior using both ML and deep learning (DL) algorithms.

He is also a teaching assistant (TA) where he teaches courses related to cybersecurity, ML, technology management, and digital communication. Saif is an active member of NCAT's Graduate Student Association (GSAC), and he enjoys swimming on his free time.



Vaughn worked on the CS-GE2 geothermal project and focused primarily on the results visualization, graphic user interface design and programming, website design, and code development for an integrated tool platform demonstration.

He is a second-year graduate student studying

Computer Science at the University of Arkansas. His research interests include software development and cybersecurity.



The [National Nuclear Security Administration Minority Serving Institutions Internship Program \(NNSA-MSIIP\)](#) offers summer or year-long internship opportunities with the NNSA, national laboratories, and site offices. Internships involve projects focused on engineering, science,

research, technology, policy, business, and government relations.

[DOE Omni Technology Alliance Internship Program](#) provides paid 10-week summer internships for up to three consecutive summers for talented undergraduate and graduate students in Cybersecurity, Information Technology, and other related fields.



Farewell and "Have the Best Day Ever"

Congratulations to Evelyn Dale on her promotion to Business Management Specialist (BMS) supporting NETL's Science & Technology Strategic Plans & Programs (S&T). She used her skills in data analysis, project cost and reporting to contribute significantly

and in a myriad of ways to the S&T Directorate. She holds a B.A. in political science and government and B.S. in industrial engineering from West Virginia University. Her leadership, kindness, and expertise have been an inspiration.

// UPCOMING CONFERENCES AND EVENTS

SSAE federal staff and NETL support contractor have or will present or participate in the following events in August 2024:

- [2024 FECM/NETL Carbon Management Research Project Review Meeting](#)

Pittsburgh, PA, August 5–9, 2024

Presenters:

- Gabe Creason – Where are the Data? Automating a Workflow for Carbon Storage Data Gap Analyses
- Gregory Hackett – Power FEED Study Reviews/ Comparison to Baseline
- Sally Homsy – Cement Plant TEA/LCA
- Sally Homsy – Carbon Dioxide Removal (CDR) Systems Analysis
- Chung-Yan Shih and Hyoungkeun Kim* – Wafer-Scale Engine Applications for CCS
- Kirk Labarbara – REPACT: CO Transport Pipeline Reuse Screening Tool,
- MacKenzie Mark-Moser – CO₂_S_COM_ Offshore: A Technoeconomic Analysis Tool for Offshore Saline Carbon Storage (FWP-1022464)
- David Morgan and Chung-Yan Shih – NRAP Task 5 – Developing Workflow and Computational Tools to Estimate Project Costs of Managing Subsurface Risks
- David Morgan and Chung-Yan Shih – -Overview of the NRAP/SMART Technoeconomic and Liability Evaluation for Storage (TALES) Model
- David Morgan and Alana Sheriff* – Overview of the FECM/NETL CO₂ Transport Cost Model (CO₂_T_COM) (FWP-1022464)
- Dave Morgan – Onshore CO₂ Transport and Storage (FWP-1022435)
- Julia Mulhern* – International Offshore Carbon Transport and Storage Inventory

Poster Presenters:

- Douglas A. Allan* and Anca Ostace* – Jacobian-based Model Diagnostics and Application to Equation Oriented Modeling of a Carbon Capture System
- Douglas Allan * – Jacobian-Based Model Diagnostics and Application to Equation Oriented Modeling of a Carbon Capture
- Ray Boswell, and Ashley Douds, Indiana Geological and Water Survey – Geologic Characterization of Potential CO Storage Volumes: Mt. Simon Sandstone of Indiana

- Lingyan Deng* – CCSI² Toolset: Framework for Optimization, Quantification of Uncertainty, and Surrogates Capabilities
- Lingyan Deng * – Model-based Sequential Design of Experiments for Pilot Testing of Novel Water-Lean CO Capture Solvent
- Anuja Deshpande * – Techno-economic Analysis and Optimization of Point Source Solvent-Based Carbon Capture Systems at High CO Capture Levels for NGCC Power Plants
- Ryan Hughes * – Modeling and Analysis of Climate Variation Effects on Fixed Bed Direct Air Capture Systems
- Jorge Izar-Tenorio* – Life Cycle Analysis of Enhanced Rock Weathering
- Sarah Leptinsky * – Enhanced Weathering Techno Economic Screening Analysis (23CFE000075)
- Guoxiang Liu – Case Study of Risk Considerations for Transitioning CO₂-EOR Field to Dedicated CO Storage (FWP-1025009)
- Ben Omell – FOA 2614 Round 3 Kickoff Engineering-Scale/Pilots – Power and Industrial
- Roksana Mahmud* and Thomas Schmitt* – Life Cycle Analysis of Techno Economic Analysis of Marine Carbon Dioxide Removal (89243323CFE000075)
- Hari C. Mantripragada * – Techno-Economic Assessment of Direct Air Capture with Microwave-Assisted Regeneration
- Austin Mathews* – GEES as a Mechanism to Facilitate the Commercialization of Geologic Carbon Sequestration (FWP-1022464)
- Kshitij Patel * – Updates to NETL's Sorbent DAC Case Study
- Priyadarshini * – Monitoring, Reporting and Verification Considerations for Carbon Dioxide Removal
- Chung-Yan Shih – CO₂_S_COM: Modeling the cost of onshore CO₂ storage in saline reservoirs
- Derek Vikara* – SMART Task 6: Evaluation of the Costs of Geologic CO Storage for the Illinois Basin Decatur Project Site using the NRAP/ SMART Technoeconomic and Liability Evaluation for Storage (TALES) Model

// UPCOMING CONFERENCES AND EVENTS

(cont'd)

- Derek Vikara* – NRAP Task 5: Preliminary Evaluation of the Cost of Responding to Hypothetical Leakage Scenario Using the NRAP/SMART TALES Model and other NRAP Tools (NRAP FWP-1025009)
- Olivia Sward – Insurance Options for the Bulk Power Systems of California and Texas in the Face of Rising Risks
- Neyda Maymi* – Carbon Storage Technical Viability Approach Matrix and Methods (FE-1025007)

Technology Demonstrations:

- David Morgan – Demonstration of the NRAP/SMART TALES Model (FWP-1025009)
- Alana Sheriff* and Taylor Vactor* – CO₂ Transport and Storage Cost Modeling Tools
- Travis Warner* – FECM/NETL CO Capture, Transport Storage (CTS) Cost Screening Tool
- Araceli Lara* – Carbon Storage Technical Approach Database and Initial Data Availability Results Demo (FWP-1025007)

Active Participants:

- Peter Balash, Indrajit Bhattacharya, Luciane Cunha, Alicia Dalton-Tingler, Marc Turner*, John Wimer, Alexander Zoelle*

- [ARPA-E Ammonia and Critical Minerals Recovery Workshop](#)
Washington, DC, August 20–21, 2024
Active Participants: Timothy Bartholomew, Alison Fritz
- [Produced Water Society Permian Basin Conference](#)
Horseshoe Arena Midland, Texas, August 12–14, 2024
Presenters: Philip Tominac*, Elmira Shamlou*, and Sangbum Lee - Project PARETO – DOE's Produced Water Optimization Initiative: Produced Water Sharing and Trading
Active Participant: Markus Drouven

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Models / Tools / Databases

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