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IN THIS ISSUE:

UNIVERSITY OF WYOMING

School of Energy Resources

QUARTERLY NEWSLETTER

Vol. 3, Issue 1

ACADEMICS

RESEARCH

OUTREACH

MESSAGE FROM THE EXECUTIVE DIRECTOR

To the SER community,

2022 is off to a great start at the School of Energy Resources.

There have been exciting advancements in our research centers of excellence, as always this work is focused on our ultimate goal of producing positive, meaningful impacts for the state of Wyoming. The Wyoming CarbonSAFE Project team completed its second test well near Dry Fork Station in Campbell County. The two wells meet Class VI standards, the type of well needed for CO_2 injection, and we believe these will be the first Class VI CO_2 injection and storage wells in Wyoming.

The Carbon Engineering Initiative has scaled-up multiple projects in a series of field tests and we are learning more about the products, optimizing the process and making progress toward the end-goal, which is commercialization that will result in incremental Wyoming coal consumption. For example, the coal-derived soil amendments continue to show promising results on Wyoming crop and soil health, while the construction of a demonstration house constructed with several coal-derived materials, including bricks, mortar, flooring and more, and is located on campus and is nearing completion.

We welcome the addition of Eugene Holubnyak to lead SER's newest center of excellence, the Hydrogen Energy Research Center. We are fortunate to have received exceptional support from the Wyoming legislature, US Department of Energy, Williams Foundation and The Anschutz Corporation to help stand up the center; we are excited for what the future holds for hydrogen and how it can benefit Wyoming and its energy producers.

SER researchers continue to develop various facets of the rare earth element and critical mineral value chain. This includes progress on a pilot project located at the Wyoming Innovation Center in Gillette to extract rare earth elements from coal-ash.

The academic program continues to see growing enrollment and interest from students desiring a quality education and hands-on learning experiences.

Finally, SER followed the most recent legislative session closely and we are encouraged by the continuing efforts of our Wyoming leadership to work toward a robust energy economy, incorporating the vast resources that the state has to offer. We are grateful for the sustained legislative support as we work to accomplish our mission to drive energy-driven economic development for the state of Wyoming.

Sincerely,

Holly Krutka

Holly Krutka, Ph.D.

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ACADEMICS

Energy Resource Management and Development Students Visit WOGCC

Students in the Energy Resource Management and Development (ERMD) degree program at the School of Energy Resources (SER) traveled to Casper on March 8 to visit the Wyoming Oil and Gas Conservation Commission (WOGCC).

The annual trip coordinated with the commission allows ERMD students in the Professional Land Management concentration and the Energy and Environmental Systems concentration to attend a full day of activities including examiner hearings, a tour of the facilities, and an opportunity to view the full commission deliberate over issues related to oil and gas development in the state.

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SER Academic Director Kami Danaei, Emily Latiegne, SER Student Relations Representative Karolina Klatka, Kendall Klos, Caleb Bowen, Caleb Durgen, (back row) Eli Vigil, Montgomery Hughes, Kieran McMullen, Hunter Lee, Michael Fenton, Micah Brandt, Shane Heavin, and PLM Director Kris Koski.

Micah Brandt

Student Profile: Micah Brandt

When **Micah Brant** was exploring different options for college, he stumbled upon the University of Wyoming School of Energy Resources (SER) and knew immediately it was the one. It satisfied every box on his list. Affordable? Check. Close to home? Check. Beautiful location with outdoor activities? Check. Rigorous academic program with robust career opportunities? Check.

Now a sophomore in the Professional Land Management (PLM) concentration of the Energy Resource Management and Development (ERMD) Bachelor of Science degree program, Brandt is more than pleased with his choice of degree program and is excelling in his studies.

A native of Denver, Colo., Brandt is also an active member of the Army ROTC Cowboy Battalion. Working towards his degree while also devoting much of his time to military service has been both challenging and rewarding.

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Academics Highlights

- Four members of the **Kaszuba** research group in the Geology and Geophysics Department presented at the American Geophysical Union (AGU) Fall Meeting in New Orleans in December. **READ MORE >**
- ERMD Alumnus **Sam Mallory** has been named the newest member of the PLM Advisory Board. Mallory graduated in the PLM concentration in 2018 and works at Shell Oil Company as a Valuation Analyst.

RESEARCH

Eugene Holubnyak to Direct Hydrogen Energy Research Center at UW

Eugene Holubnyak is the latest center of excellence director in the University of Wyoming School of Energy Resources (SER), taking the helm in the Hydrogen Energy Research Center (H_2ERC).

Holubnyak is charged with managing SER's efforts to identify and quantify the relative competitive advantages of Wyoming in an emerging low-carbon hydrogen economy.

Originally from Lviv, Ukraine, Holubnyak earned his B.S. and M.S. in information systems and technology from Lviv Polytechnic National University, followed by an M.S. in aerospace engineering from the University of North Dakota. He currently is an applied geoscience doctoral candidate at Heriot-Watt University.

Before joining SER, Holubnyak established himself as an expert in carbon capture, utilization and storage (CCUS), with more than 14 years of experience in applied geoscience and energy-related research. He previously served as a CCUS program lead at Kansas Geological Survey and spent substantial time working on the Plains CO_2 Reduction Partnership, of which Wyoming is a member.

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UW's SER Receives $500,000 Williams Contribution to Fund Hydrogen Energy Research Center

The University of Wyoming's School of Energy Resources (SER) received a $500,000 commitment from energy infrastructure leader Williams to help fund the school's Hydrogen Energy Research Center (H_2ERC).

The gift will be spread over five years to support the new center dedicated to applied hydrogen research, collaboration with Wyoming stakeholders and the growth of a hydrogen industry in Wyoming.

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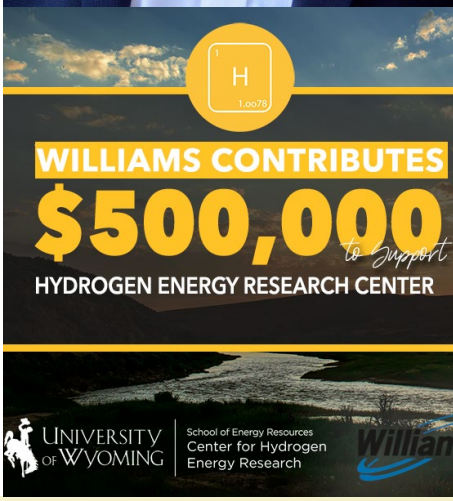

Research Highlights

- The Nuclear Energy Research Center (NERC) in the University of Wyoming's School of Energy Resources (SER) is seeking proposals from UW faculty members currently receiving or pursuing sponsored research for nuclear-related projects. Physical and social science proposals are encouraged for two mini-grant opportunities related to faculty research. Proposals will continue to be accepted through May 15.
  READ MORE >

- The University of Wyoming School of Energy Resources (SER), Baker Hughes and the Wyoming Energy Authority are collaborating to offer UW students an opportunity to introduce novel solutions in the decarbonization space through a $5,000 ideation innovation contest. The "Decarbonization Prize" focuses on discovering innovative applications for existing products and services, or to introduce new concepts for innovative, transformative and disruptive technologies that will decarbonize various industries. **MORE INFO >**

Center for Economic Geology Research

Wyoming CarbonSAFE Project Team Drills Second Exploratory Well at Dry Fork Station

Led by the University of Wyoming School of Energy Resources (SER) and in collaboration with Basin Electric Power Cooperative, a team of researchers and partners on the Wyoming CarbonSAFE Project drilled a second deep test well for site characterization.

Adjacent to a first well that was completed in 2019, the new well allows researchers to gain valuable data and fully characterize the geologic layers of the subsurface site, including the target storage reservoirs and the cap rock seals.

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Wyoming PRB#2

The School of Energy Resources Adds Robert Gregory to CORE-CM Team

The School of Energy Resource's (SER) Center for Economic Geology Research (CEGR) hired **Robert "Bob" Gregory** in January 2022 to expand the team of research scientists working on the carbon ore, rare earth and critical mineral (CORE-CM) projects.

Originally from Great Falls, MT, Gregory grew up in Casper and has spent over 37 years in Laramie. After earning a bachelor's degree in Physical and Sedimentary Geology from the University of Wyoming in 1985, he embarked on a 30-year career as a geologist for the Wyoming State Geological Survey (WSGS). He later earned a master's degree from UW in Metamorphic Petrology, graduating in 2009.

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Bob Gregory

UW SER Publishes Study on Domestic Critical Mineral Production From Coal Byproducts

Researchers in the University of Wyoming's School of Energy Resources (SER) have published a collaborative study on the potential for domestic critical mineral (CM) and rare earth element (REE) production from unconventional sources in the United States. Released in the Renewable and Sustainable Energy Reviews journal, the study provides a geologic assessment of CM and REE occurrences in coal fly ash sourced from the Powder River Basin, as well as a complementary economic and policy analysis that explores a viable way to produce more of these critical minerals domestically from coal byproducts. **READ MORE >**


Davin Bagdonas led CM from coal byproduct study

CEGR Highlights

- The School of Energy Resources has named **J. Fred McLaughlin** as the director of the Center for Economic Geology Research. McLaughlin has served as the interim director of the center since June 2021. **READ MORE >**

- **Nadia Dworian**, a University of Wyoming undergraduate student from Anchorage, Alaska, will work with U.S. Gold Corp. on the Copper King (CK) Gold Project, located near Curt Gowdy State Park in southeastern Wyoming as part of the SER collaboration on the project. **READ MORE >**

Center for Energy Regulation and Policy Analysis

CERPA Releases Paper on the Economic Analysis of Rare Earth Elements

The Center for Energy Regulation & Policy Analysis (CERPA) in the School of Energy Resources (SER) has released a resource paper that provides an economic analysis of Rare Earth Elements (REE).

The paper entitled, *An Analysis of the Current Global Market for Rare Earth Elements*, is the first in a two-part series focusing on the REE industry, and aims to provide a base understanding of REE, the REE production and extraction process, an overview of the global REE market, and a summary of US government interest, policies, and funding being directed to further the development of a REE supply chain in the US.

The paper was authored by **Melissa Firestone**, an energy economist working under contract with CERPA, in collaboration with **Jada Garofalo** of SER for policy support.

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Melissa Firestone

UW Research Examines Wyoming Community Perspectives on Net-Zero Carbon Energy Economy

Led by **Selena Gerace**, a new study from the University of Wyoming School of Energy Resources (SER) Center for Energy Regulation and Policy Analysis (CERPA) explores Wyoming residents' views on achieving a net-zero carbon energy economy.

The survey, conducted on the request of the U.S. Department of Energy, specifically examines the needs, expectations and concerns of Wyoming citizens related to a carbon-neutral future, as well as the opportunities and technologies that stakeholders feel will be more effective in meeting that goal in Wyoming.

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Selena Gerace

CERPA Highlights

- The School of Energy Resources is seeking applicants for the Center for Energy Regulation & Policy Analysis Director. This position leads a team to produce research that leads to webinars, seminars, white papers and peer-reviewed publications focused on energy regulation and policy analysis. Details and requirements of the position can be found here. **APPLY NOW >**

- CERPA research affiliate **Haibo Zhai**, an Associate Professor of Civil and Architectural Engineering, has had an article accepted for publication in ***Environmental Science & Technology*** Magazine. The article, "On the Policy-Driven Potential for Deploying Carbon Capture and Sequestration in a Fossil-Rich Power Sector," is forthcoming.

Center for Carbon Capture and Conversion

Field Tests of Coal-Derived Soil Amendments Yield Promising Results for UW Researchers

University of Wyoming soil science researchers are conducting preliminary tests of a coal-derived soil amendment that so far is producing results similar to another popular soil amendment, biochar.

The project is part of the carbon engineering initiative in the UW School of Energy Resources' (SER) Center for Carbon Capture and Conversion (CCCC). The CCCC is focused on supporting the future of Wyoming coal and creating non-energy and fuel uses that yield economic development and diversification opportunities.

Resham Thapa, from Pyuthan, Nepal, a Ph.D. candidate in the UW College of Agriculture and Natural Resources, is leading the project for his dissertation research. The concept of coal-based soil amendments provides a new, non-thermal and a potentially high-volume use for Wyoming coal, while promoting increased crop yields, improving soil fertility and retaining moisture in a sustainable way.

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Resham Thapa

UW Center Breaks Ground for Char Demonstration House

The Center for Carbon Capture and Conversion (CCCC) in the University of Wyoming's School of Energy Resources recently broke ground on a demonstration house made of coal-derived carbon building materials and char bricks.

The house is being built in tandem with a second house made from conventional building products and Pacific Clay bricks. The coal-derived bricks are made using low-energy, eco-friendly process technologies developed in the CCCC.

The goal of the project is to see how the coal-derived building materials, especially char bricks, stand up to different environmental conditions and compare to conventional building materials that are currently used in the market.

READ MORE >

CCCC Highlights

- **Dr. Kam Ng** in the Dept. of Civil and Architectural Engineering was awarded the Samuel D. Hakes Outstanding Graduate Research and Teaching Award 2022 in the College of Engineering and Applied Sciences. Additionally, he was the recipient of the 2022 UW Mid-Career Graduate Faculty Mentor Award. Dr. Ng is the PI on the coal to building materials project in the CCCC.

- **Chooi Kim Lau** defended her master's thesis on the coal-derived char bricks developed in the CCCC. Lau is the lead graduate student on the project and is leading the construction efforts of a demonstration house built of char bricks on campus.

- **Dr. David Bell**, a professor of chemical engineering is retiring after 29 years of service to the University of Wyoming. Dr. Bell has been instrumental in the development of the pyrolysis process developed in the CCCC to convert Wyoming coal into product feed stocks.

OUTREACH

UW SER to Host Rocky Mountain Professional Landman Conference April 29

The University of Wyoming School of Energy Resources (SER) will host the Rocky Mountain Professional Landman (PLM) Conference Friday, April 29.

The in-person forum seeks to bring together industry professionals and PLM alumni in the Rocky Mountain region to showcase the esteemed profession; discuss current topics and issues facing the industry; and explore career paths and opportunities for future graduates.

The conference will take place from 8 a.m.-1 p.m. at the UW Conference Center, located at the Hilton Garden Inn at 2229 Grand Ave.

James Devlin, the current president of the American Association of Professional Landmen (AAPL), will headline the event as the keynote speaker.

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SER Hosts Webinar on Social and Environmental Justice Related to Rare Earth Element and Critical Mineral Industry in Wyoming

The UW School of Energy Resources hosted a webinar panel discussion on social and environmental justice on Tuesday, April 5, 2022.

The panel gathered community leaders, academic experts, and federal representatives to discuss the topics of social and environmental justice as they relate to the Department of Energy (DOE) sponsored Carbon Ore, Rare Earth, and Critical Mineral (CORE-CM) projects.

As an important issue at the forefront of energy development, the panel sought to define the topics of social and environmental justice as they relate to CORE-CM project basins, provide regional and native community perspectives, outline federal expectations, and explore concerns covering environmental health and safety, and potential legal and policy issues.

WATCH HERE >

Outreach Highlights

- The University of Wyoming (UW) School of Energy Resources (SER) was privileged to host **Congresswoman Liz Cheney** on a visit to campus. Cheney is Wyoming's sole representative in the U.S. House of Representatives. SER collaborates with stakeholders at the state, national, and international levels to advance energy technologies and policies to grow and support Wyoming's robust energy sector. **READ MORE >**
- Please stay up to date on our upcoming events by checking the **EVENTS CALENDAR >**
- The American Heritage Center is housing the Anaconda Geological Exploration Collection database. **GO TO DATABASE >**
- Please consider participating in the Malcolm Wallop Profiles in Wyoming Resilience Research Project Confidential Survey. Details can be found here: **SURVEY >**

School of
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