



2026 SARE Project Descriptions

SARE Project Title	University/ College	Faculty/ Email	Full-time/ Part-time	In-person/ Virtual	SARE Opportunity Description	Will student be driving vehicle?
Mapping Northern Idaho Springs	University of Idaho	Mary Engels Engels@uidaho.edu	No preference	In-person	<p>This project seek to inventory and map springs on conservation lands in northern Idaho to document and protect spring biodiversity. Data from this project will be used to prioritize and pilot conservation methods that support biodiversity at springs and potentially position sites for inclusion as priority ecosystems in the biodiversity crediting markets. Students will interface with public, non-profit, and private land owners to gather spring histories and to collect field data using SEAP protocols for inclusion in the Springs Online database hosted by the Springs Stewardship Institute.</p> <p>The student will be collecting field data on spring using protocols developed by the Spring Stewardship Institute and will be responsible for cleaning field data and uploading data to the Springs Online database. Student will learn valuable field survey skills and will develop data management and interpretation skills, stakeholder communication skills, and scientific communication skills. Ideal students for this position will be passionate about fieldwork, be detail oriented, and will have keen observational skills.</p>	Yes, personal vehicle
Steelhead Survival	University of Idaho	Matt Falcy mfalcy@uidaho.edu	Full-time	In-person	<p>Analyze Idaho steelhead count data to determine ocean survival. Statistically connect steelhead ocean survival to Columbia River hydropower operations (spill) and physical oceanic conditions like El Nino and sea surface temperature. Collaborate with graduate students in my lab and present findings in a writing and/or at a professional conference.</p> <p>I desire a student with a background in math/statistics and an interest in ecology. The student will learn advanced statistical analyses and gain experience applying these techniques to real-world data in a socially important context. The student will also obtain experience communicating technical results to professionals with and without advanced statistical knowledge.</p>	No
1) Studying the Ability of Small Modular Reactors to Meet the Energy Needs of Data Centers in	University of Idaho	Brian Johnson bjohnson@uidaho.edu	Full-time	In person	<p>The project will perform a simulation study to explore the impact of large data center loads on different classes of stability of the power system considering different levels of wind and solar generation for varying levels of yearly water availability for hydroelectric generation. Different locations for data centers will be considered. Then the research project will explore how co-located small modular reactor-based (SMR) power generation can mitigate some of the negative impacts of data centers. The project will use a large-scale model of the western power grid. A secondary objective is an examination of the impact of the availability of hydrogeneration on the return on investment on the costs for SMRs.</p>	No

<p>Idaho Considering Varying Levels of Water Available for Hydroelectric Generation</p>					<p>The student will learn to perform transmission studies using the Powerworld power system simulator. They will build models for small modular reactors and data centers appropriate for steady-state and dynamic studies. The student researcher will have be able to interact with engineers from Idaho Power to learn a utility perspective how to organize studies to consider ranges of scenarios for load growth, wind and PV generation, and differing levels of availability of water for hydrogeneration. The student researcher will also be able to interact with researchers at INL to better model small modular reactors. Student will also be able to interact with an intern at INL who is performing an economic analysis of SMR installations.</p>	
<p>2) Development of Educational Materials on Impacts of Choice of Irrigation Techniques and Crop Types on Energy-Water Use in Agriculture</p>	<p>University of Idaho</p>	<p>Brian Johnson bjohnson@uidaho.edu</p>	<p>No preference</p>	<p>No preference</p>	<p>Design choices for irrigation systems and selection of crops to be irrigated has a significant impact the energy water needs of agriculture in Idaho. This project will analyze water use for different selections of crops or irrigation system and use that as a basis for educational materials.</p> <p>The student will learn the energy and water requirements of different options for irrigation systems and crop selections such as that promotes the adoption of less water-thirsty crops—specifically buckwheat, rye, and other local Idaho heritage crops. Then the student will develop educational materials describing the trade offs and promoting the benefits of change.</p>	<p>No</p>
<p>Understanding Columbia Spotted Frog distribution and habitat features: risk characterization for geothermal energy exploration and development</p>	<p>University of Idaho</p>	<p>Tracey Johnson traceyj@uidaho.edu</p>	<p>Full-time</p>	<p>Both (see notes in description)</p>	<p>This project will aid in examination of effects of physical infrastructure of energy-water systems on flowing water and its wildlife end-users. We will describe population abundance and distribution of Columbia spotted frogs (CSF; <i>Rana luteiventris</i>) in relation to riparian and aquatic habitat features at University of Idaho's Rinker Rock Creek Ranch, a biological research station near Hailey, Idaho. The data collected will be used to inform risk characterization for impending geothermal energy exploration and possible development near the ranch and may contribute to future environmental assessments. The student will compile relevant scientific literature, collect and summarize field-based data, and evaluate how CSF at the ranch may be affected by geothermal energy exploration and development within or near the watershed.</p> <p>The student will learn sampling design and field-based methods for sampling aquatic amphibian populations and their habitat. Field sampling will include hiking mostly through riparian zones conducting sight surveys for frogs and temporarily restraining them for identification and measurement while following safety and animal-handling protocols. Field sampling will also include sampling water temperature, flow, quality, depth, etc. and possibly some plant identification. Data will be entered and summarized. The qualified student will be able to: hike off trail for several miles per day while potentially encountering cows, rattlesnakes, moose, etc.; work in challenging conditions including heat and rain; navigate using a GPS; learn to identify frogs and some plants with faculty training and assistance; collect data while following strict protocols; potentially live in a remote field setting (i.e., wall tent, outdoor shower, cooking outside) with interns, graduate students, and faculty at the ranch; use Microsoft Office, ArcGIS, and potentially Program R to summarize data.</p> <p>**The student will need to spend all or most of their time during summer 2026 working and living in person at Rinker Rock Creek Ranch while gathering and analyzing data.</p>	<p>Yes (personal vehicle) or possibly a ranch truck. Very occasional use of a UTV may be required.</p>

					Planning meetings before data collection commences can take place virtually. Faculty is based at UI Boise and spends substantial time at the ranch	
AI-Enabled Knowledge Mapping of Data Center Water Impacts for Community Decision Support	University of Idaho	Kendra Kaiser kkaiser@uidaho.edu	No preference	No preference	<p>This project will work with Directors from the National Institutes of Water Resources and ICREWs site leads to compile and refine a set of guiding questions for state, regional, and rural decision-makers evaluating data center proposals in their communities. These resources will address topics such as where the water and energy will come from, if hydrological modeling of drawdown impacts have been done, if the data center will be willing to share water and energy data and other infrastructure and policy implications. The student will also help create an organized framework for leveraging artificial intelligence for identifying and synthesizing information sources to help NIWR Directors keep pace with the rapidly evolving news about data centers and water across the country. The resulting AI-curated knowledge base and question set will support informed decision-making about water resources across the country.</p> <p>The student will be learning about how to leverage AI tools responsibly for research, about how decision-makers evaluate whether to allow a data center to be built, the breadth of impacts occurring across the country. Desired skills: critical thinking, writing, interest in collaborative and interdisciplinary research. Students that are interested in water resources are particularly encouraged to apply.</p>	No
Greater Coeur d'Alene Watershed History	University of Idaho	Alyssa Kreikemeier akreikemeier@uidaho.edu	No preference	No preference	<p>This project will research and collect historical and archival data on the history and use of the Coeur D'Alene Lake watershed and its surrounding environment. It will look at how the removal of the beaver population during the Idaho fur trade era affected both the natural environment and the future development of the watershed and its nearby rivers and forests. Using responsible research practices in historical sources and archives, it will integrate the environmental history of the Coeur D'Alene watershed and lake with the history of the Coeur D'Alene Tribe. It will also address the detrimental effects of settler-colonialism that the fur trade initially brought to the Pacific Northwest and its lasting impact on the region.</p> <p>The student will gain hands-on experience in historical and archival research and environmental history, including how to access and navigate large archival collections and historical records databases. The student will learn how to communicate professionally with state and Tribal archivists and learn responsible research practices in working with sovereign Tribal data in respect to Tribal interests. They will learn how to work with both digital archives and physical records at the Idaho State Archives in Boise, ID and in the Coeur D'Alene Tribal archives. The student will also learn how to collaborate with fellow researchers on data collection, management, and reporting methods for the larger overall project.</p>	No
Quantifying Sulfur and Iron Availability in Waste Rock to Predict Acid Mine Drainage Potential	University of Idaho	Jeff Langman jangman@uidaho.edu	Full-time	In-person	<p>Acid rock drainage (ARD) is a worldwide environmental issue for the mining industry, including mining companies in Idaho, such as the release of ARD from the Bunker Hill Mine in the Silver Valley of Idaho.</p> <p>An ongoing project is examining the ARD that is emanating from a sulfidic waste rock stockpile at the Red Dog mine site near the Arctic Circle in Alaska. The ARD impacts the operation of the mine and the ability of the mine operator to discharge water to the environment at this globally significant zinc mining facility (10% of the worldwide zinc supply is produced at this mine).</p>	No

					The UI research team collected waste rock samples from the stockpile during a drilling event to analyze the rock for its acid-generating capacity. The goal is to assist the mine operator in understanding the acid-generating potential of the stockpile to design appropriate remediation efforts. Such efforts are common to the industry, which has struggled to manage this problem that has caused significant deleterious effects around the world, including the designation of the Bunker Hill Superfund site in the Silver Valley.	
Developing a Landlab model to study the spatial and temporal variation of Idaho's river water quality - Application to Stream Temperature	University of Idaho	Angel Monsalve amonsalve@uidaho.edu	Full-time	In-person	<p>As river temperatures show dramatic variability, understanding these shifts is critical for the resilience of regional energy-water (E-W) systems and aquatic ecosystems, where temperature governs dissolved oxygen solubility, nutrient cycling rates, and species metabolic performance. To predict where and when critical thermal thresholds are exceeded, we will develop a spatially explicit thermal model that will be directly incorporated into the open-source Python framework Landlab. Because temperature controls most chemical and biological reaction rates in water, successfully modeling these thermal dynamics within Landlab's modular architecture serves as the foundational first step toward building a comprehensive, multi-parameter river water quality model. To ensure this newly developed model accurately captures real-world complexities, the project will heavily feature active field sampling to collect direct evidence and validate the computational results.</p> <p>In this opportunity, the student will gain practical experience at the intersection of computational ecohydraulics and field-based data collection. The student will learn how to measure critical hydrological parameters and integrate them into an open-source numerical modeling environment. Specifically, they will:</p> <ul style="list-style-type: none"> • Collect field measurements of water temperature, depth, and flow velocity using modern hydraulics instrumentation. • Contribute to the development and testing of a river temperature model within the Python-based Landlab framework. • Apply collected field data to validate the computational model, gaining a deeper understanding of temperature transport mechanisms. • Analyze spatial and temporal variations in stream temperature to assess their broader impacts on river water quality. <p>Desired knowledge/skills include:</p> <ul style="list-style-type: none"> • Basic understanding of fluid mechanics and river hydraulics. • Interest in field-based research and a willingness to work in outdoor river environments. • Familiarity with, or a strong willingness to learn, Python programming. • Data analysis capabilities and high attention to detail. • Ability to work collaboratively across both field and computational settings. <p>This experience will provide valuable training in computational modeling and hydraulics field methods while contributing to research on how dramatic variations in stream temperature affect overall water quality in Idaho's river systems.</p>	No
Biological Control of Fermentation Contamination to Improve Energy–	University of Idaho	Paul Rowley prowley@uidaho.edu	Full-time	In person	We estimate from our surveys of brewers that 50% have suffered at least one diastatic yeast contamination - we do not know the frequency of these events. The average loss (likely to be an underestimation) is \$30,000 per event. There are 9,796 operating U.S. craft breweries, which means that if 50% of breweries have suffered a loss of ~\$30,000, the total loss is \$147M. Assuming a cost of \$40 of raw materials per barrel of beer, that would mean a loss of ~3.7M barrels lost (114M gallons), and the brewing industry	No

Water Efficiency and Resilience in Brewing Systems					<p>consumes 4–6 L of water for every liter of beer. That would mean 22 million barrels of water lost (682 million gallons). Average energy usage to make a barrel of beer is 66 kWh, which would mean a loss of 244M kWh of energy.</p> <p>This project evaluates antifungal “killer” yeasts as a biological strategy to prevent contamination by <i>Saccharomyces cerevisiae</i> var. <i>diastolicus</i> in fermentation systems, reducing reliance on energy- and water-intensive mitigation approaches such as pasteurization, filtration, and equipment sterilization.</p> <p>The student will quantify how toxin-mediated biocontrol alters fermentation stability, resource use, and process resilience under variable environmental conditions. This work will contribute to building a more sustainable and resilient fermentation-based industry, saving both water and energy. The student will investigate how biological antifungal strategies (killer toxins) can replace or reduce conventional contamination control methods that require significant energy (e.g., heat pasteurization) and water (e.g., cleaning and sterilization cycles). They will perform controlled fermentation experiments comparing traditional and toxin-mediated approaches, generating datasets on growth inhibition, fermentation performance, and stability. They will also look to improve the efficacy of natural antifungal agents to better control diastatic contamination. This will be achieved by molecular modeling of killer toxins structures and correlating improved antifungal activities with changes to protein structure and function.</p> <p>Students should have evidence of coursework or exposure to microbiology, biochemistry, molecular biology, or a related field and a basic understanding of molecular/cell biology and microbial growth. Ideally (but not essential), students should have familiarity with aseptic technique and microbial culturing and experience with basic laboratory methods (e.g., pipetting, solution preparation, growth assays). Students should be comfortable with basic data analysis (e.g., Excel, R, or similar tools) and have strong organizational skills and the ability to maintain accurate lab records.</p>	
Combining Open and Site-Specific Data for Agricultural Water Management	University of Idaho	John Shovic jshovic@uidaho.edu u	Full-time preferred Part-time acceptable	In person preferred Hybrid acceptable	<p>We have been developing an agriculturally-focused wireless sensor network with a partner vineyard in Virginia, which includes sensors measuring soil moisture, plant water uptake, temperature, humidity, and rainfall. This project continues this research by having the student develop technology to synthesize the existing site-sensed data with free OpenET (Open Evapotranspiration project, funded by a public-private consortium including NASA) data to understand the relation between evapotranspiration, vapor pressure deficit, and precipitation and irrigation events in the vineyard. This study aims to define interactions between vine behavior and environmental water factors and determine irrigation practices and schedules that meet plant needs while minimizing agricultural inputs. This study also aims to create and document open-source tools for visualizing this information.</p> <p>The student will be using the free Grafana visualization software along with databases and the Python programming language. Some familiarity with programming will be useful. Student will be analyzing data, creating visualizations and reports, and meeting with stakeholders. An interest in wireless sensing networks, agriculture technology, or software development is useful.</p>	No
Energization: an Educational Resource	University of Idaho	Terence Soule tsoule@uidaho.edu	Full-time	In-person	<p>The goal of this project is to finish the development of Energization an educational, resource management game focused on energy systems that was started last summer via a prior SARE award. Players represent different regional energy utilities and make decisions about resource development, sustainability, investment, system</p>	Not as part of the project, with the possible exception of

<p>Management Game Focused on Energy Systems</p>				<p>interconnection, competition, and cooperation in a contiguous game space comparable to the western US in geography, energy intensity, water and other natural resources, and urban/rural mix.</p> <p>The goal of this project is to finish development an educational, resource management game Energization focused on energy systems, using new students (the students from the previous SARE are graduation). In the game players represent different regional energy utilities and make decisions about resource development, sustainability, investment, system interconnection, competition, and cooperation in a contiguous game space comparable to the western US in geography, energy intensity, water and other natural resources, and urban/rural mix. Initially, this game will be deployed for educational purposes within the University of Idaho curricula such as Energy Literacy courses and the Energy Executives Course. Ideally, the game will prove both entertaining and effective enough that it could be used in secondary education courses by STEM educators throughout the state.</p> <p>The game will support two-six teams (with AI's allowing individual play) and have an instructor interface through which the instructor can monitor player decisions and can modify the environment (e.g. changing demand, introducing new technologies, changing legal requirements, triggering accidents, etc.). A typical game will consist of ~ten turns spanning ~seven decades of virtual time, with the exact time scale set by the instructor. Games can be spread over several days, e.g. one set of decisions per real day, providing the instructor time to discuss the impact of each round of decisions. The game loop will be:</p> <ul style="list-style-type: none"> • Teams separately and simultaneously make decisions about their own utility operation. They can communicate during this time, agreeing to share resources, enforce regional policies, etc. • Teams enter their decisions into the computer. • The simulation updates the environment. • The instructor can intervene to change the scenario. • Repeat • Success will be measured by how well regional demand for energy is met, while preserving resources, maintaining stability, etc. <p>For the proposed SARE students will be finishing the game Energization, including:</p> <ul style="list-style-type: none"> • Completing the networking that allows multi-player capabilities. • Completing the instructor interface. • Testing and refining the underlying model of energy economics. • Final game testing, which will include refinements of the user interface and overall game balance. <p>The participants, who will be new to this project, will be learning about energy systems, including their interplay with water and other natural resources, the economy, economic and population growth, etc. And will be developing their programming and related skills involved in developing educational video games.</p> <p>The primary desired skills are experience with programming, and ideally game development, and a willingness to learn, as much of the energy systems and related knowledge is likely to be new.</p>	<p>driving to the final poster presentation/conference.</p>
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<p>Linking Satellite Observations and Field Data to Improve Understanding of Reservoir Management Impacts on Lake Coeur d'Alene Water Quality</p>	University of Idaho	<p>Meg Wolf mawolf@uidaho.edu</p>	Full-time		<p>This project will collect and analyze long-term water quality data to support restoration and management planning for Lake Coeur d'Alene in North Idaho. Coeur d'Alene Lake is a naturally occurring lake that is managed as a reservoir at its outflow to the Spokane River at the Post Falls Dam, a key regional hydroelectric power source. Current management maintains elevated lake levels late into the summer to extend power generation, which connects wetlands that were historically disconnected from the main lake and alters nutrient cycling dynamics. These hydrologic changes may contribute to harmful algal blooms, which are closely linked to dissolved oxygen levels and have important impacts on the Coeur d'Alene Tribe and other local stakeholders. By examining the interactions between reservoir management, water quality, and algal bloom dynamics, this study will help illuminate the connections between water management and energy production in the region. Data collection and analysis will be conducted in partnership with the Baywatcher water quality monitoring program. They will integrate with other ongoing efforts related to nutrient and water quality monitoring across North Idaho lakes.</p> <p>Through participation in this project, a student intern will gain hands-on experience in surface water quality monitoring, including field-based sample collection and laboratory analysis of key water quality parameters. Interns will develop skills in data management and interpretation, satellite imagery acquisition and analysis (including Sentinel-2 chlorophyll-a products), and the integration of ground-based observations with remote sensing data to assess harmful algal bloom dynamics. This experience will strengthen students' understanding of abiotic and biotic responses to environmental change, such as nutrient and sediment loading, and understanding tradeoffs and connections between environmental management and energy generation, and build their capacity to communicate scientific findings effectively to community members, resource managers, and stakeholders across North Idaho lakes.</p>	Yes, their own vehicle/ self - transport to lakes to collect samples.
<p>Evaluating reduced tillage to manage Potato virus Y and protect water quality</p>	University of Idaho	<p>Erik Wenninger erikw@uidaho.edu</p>	Full-time	In-person	<p>Potato producers face increasing pressure to maintain the resilience of Idaho's energy-water systems by reducing agricultural runoff and energy-intensive inputs. This project investigates reduced tillage as a dual-benefit strategy: it lowers energy consumption by decreasing tractor passes and protects watercourses by reducing runoff while also reducing the need for insecticides that contribute to pollution. This research will evaluate the effects of reduced tillage on aphid vectors of Potato virus Y and beneficial predatory arthropods to determine how agroecological management practices can proactively address the impacts of environmental and technological change on energy and water systems.</p> <p>The student will collaborate with the faculty advisor and graduate students on an I-CREWS-aligned project aimed at evaluating aphid and beneficial arthropod responses to reduced tillage, a key practice for reducing energy inputs and improving energy-water system resilience. The student will gain hands-on experience in the biological sciences by sampling insects from field plots, deploying traps, and identifying specimens to quantify the value of sustainable farming practices. Beyond insect identification and data management, the student will learn how these biological outcomes provide the analytical</p>	Yes, University of Idaho passenger car or truck

					data necessary to address technological changes affecting energy-water systems. An interest in field work and the intersection of agriculture and water quality is desired; comprehensive training on sampling, identification, and curation of insect collections will be provided.	
Co-Creating Resilient Water Futures: Open Source Pathways with LiDAR Databases Amidst AI Concerns	Idaho State University	Jose Luis Benevidas josebenavides@isu.edu	Full-time	Virtual learning experience	<p>This project will investigate and utilize open source pathways for co-creation in creative workflows, toward the potential creation of a short video-art and experimental documentary. This project output will engage themes of water consumption, artificial intelligence, and environmentalism through creative modeling. Through an exploration of advanced 3D modeling and Blender tools, we'll build off ongoing knowledge-production about local-Idaho and Snake-River-Valley-to-regional concerns with AI water consumption, to visualize, model, and assess broader environmental concerns. This project aims to:</p> <ul style="list-style-type: none"> ●Explore Geographic Information Systems (GIS) maps of the Idaho-Snake River Basin that already exist in LiDAR databases online ●Create video artwork using aerial maps to explore themes of AI water consumption ●Posit ethical and sustainable AI uses by scientists and artists alike <p>Students will learn methods of engagement and experimental film/video techniques to co-construct, learn investigative documentary techniques, plus the methods, and contemporary discourse around video-art and speculative documentary practices. Students will investigate and implement Blender skills and explore open-source tools and techniques to utilize smart phone and tablet-based applications to incorporate spectrometry and LiDAR maps into their creative workflow. Students will evaluate the similarities and differences, plus the pros and cons between using spectrometry vs. LiDAR as methods of analysis, and their utility or functions in creative workflows. Students will gain added skills in advanced Blender workflows and broaden their overall research and investigative skills.</p> <p>This project seeks a student with an openness to learn, and strong desire to engage independent research. A willingness to experiment and independently explore digital softwares, a desire to co-facilitate self-guided instruction, and an ability to self-manage time, while coming back to the collaboration ready to share, build, and add newfound skills to the creative project in a scaffolded and additive process, are ideal attributes for this project.</p>	No
Applied Computational Models and Algorithmic Solutions to Common Optimization Problems In Energy-Water Systems	Idaho State University	Paul Bodily bodipaul@isu.edu	Full-time	In-person, virtual, or hybrid	<p>Sub-optimal solutions to common optimization problems in energy-water systems can result in significant inefficiencies. Examples of such problems include: Optimal Water Flow (OWF), Optimal Pump Scheduling, Sensor Placement in Water Distribution Networks, Energy-Water Nexus Planning and Scheduling, and/or Infrastructure Design and Placement. Our research lab has already developed an easy-to-use online, dynamic, interactive framework called Redux for modeling and visualizing optimization problems. The proposed research project would extend Redux to include these and similar problems/solutions, making them readily accessible to academic, industrial, and government stakeholders worldwide.</p> <p>The student will gain valuable experience in:</p> <ul style="list-style-type: none"> • full-stack development of computational models, algorithms, and visualizations; 	No

					<ul style="list-style-type: none"> development of written and oral communication skills in the context of group collaborations and research presentations; programming skill development in C#, .NET, JavaScript, Docker, D3, and git; and advanced computational theory with significant real-world application 	
Regional Economic Drivers of Water	Idaho State University	Karl Geisler geiskarl@isu.edu	No preference	No preference	<p>This project will analyze and quantify the economic drivers of water demand in the United States at the county-level by integrating data from the U.S. Geological Survey's National Water Use Science Project with data from the U.S. Census Bureau's County Business Patterns. Employing spatial econometric models to analyze this data set will show which industries tend to drive different factors of water usage while accounting for spatial heterogeneity and autocorrelation.</p> <p>The student will begin their Summer Authentic Research Experience (SARE) by merging these two county-level data sets. After the data set is compiled, the student will conduct baseline analyses to determine the most useful NAICS-level of industry aggregation. At this point in the project the student will be guided in employing spatial econometric models to find the most useful functional form with the most accurate estimates.</p> <p>This project seeks a student who expresses an interest to learn about regional economic development and spatial econometrics. A strong work ethic, attention to detail, and willingness to learn are all important when engaging in this type of project. The student completing this SARE will be expected to present their findings at a university-level event such as the Idaho State University Research and Creative Works Symposium.</p>	No
Closing the Loop: Developing Polymers to Recover Critical Minerals	Idaho State University	Courtney Jenkins jenkcour@isu.edu	Full time	In-person	<p>Idaho relies heavily on wind and hydropower and the state's energy future relies on access to critical minerals. A vast, untapped critical material resource already exists within Idaho's stockpiled mine tailings, mineral processing waste, and e-waste. We have initiated collaborations with regional partners to take advantage of these waste streams. By developing low-cost, scalable polymers designed to selectively capture and refine high-value metals from these complex Idaho waste streams, we could enhance recovery and strengthen environmental and economic performance.</p> <p>This project will focus on developing sulfur-based polymers for targeted critical mineral recovery. This project will have three central goals.</p> <ul style="list-style-type: none"> Provide students with hands on training in polymer synthesis and characterization and critical mineral extraction, including instrumentation such as NMR, LC-MS GC-MS, and ICP-OES, which will prepare the students for a range of industrial jobs. Increase student knowledge regarding the chemical importance, applications, and relevance of critical minerals in Idaho and across the world. Enhance student scientific communication skills including reading and interpreting scientific literature, creating and delivering research presentations and scientific reports. 	No
Code quality for water and energy systems	Idaho State University	Sean McBride mcbsean@isu.edu	Part-time		<p>Technological change for water and energy systems means that key elements of these systems are now under the direct control of computerized control systems. Irrigation pumps, canal gates, and dams rely on automated control systems. Cooling for power plants, heat plants, and data centers rely on a steady water supply provided through</p>	No

					<p>computer-controlled pumps and valves. This project examines the quality of the programming in these computerized systems.</p> <p>The student will engage in the following activities:</p> <ol style="list-style-type: none"> 1. Create a repository of code from energy-water systems 2. Extend methods for measuring the quality of that code 3. Prepare results for publication 	
<p>Bio-Inspired Polymers from Idaho Native Plants for Mineral Recovery from Mining Wastewater</p>	Idaho State University	<p>Kativa Sharma Sharkum2@isu.edu</p>	Full time	In Person	<p>This project seeks to develop a sustainable method for recovering valuable critical metals from Idaho's mine tailings and wastewater using the state's abundant sagebrush plants. We plan to turn natural compounds from sagebrush into special engineered polymers that can selectively capture important rare metals, like neodymium (Nd), while leaving others behind. These polymers have tiny "pockets" designed to fit the target metals, making the process highly efficient.</p> <p>The work begins by extracting and purifying natural compounds from sagebrush, which serve as the building blocks for these polymers. The recovered metals are critical for many technologies, including green energy (electric vehicle motors, wind turbines), defense systems, consumer electronics, and medical imaging devices.</p> <p>Students will gain hands-on experience in the extraction, and purification of natural products from sagebrush. They will learn biopolymer synthesis and chemical functionalization techniques such as Michael addition, diamine coupling, and polymer modification. Students will also develop skills in materials characterization techniques. Students will be trained in analytical techniques relevant to critical materials research, such as mass spectrometry, Nuclear Magnetic Resonance (NMR) spectroscopy, and chromatography for compound identification and purity assessment. They will also learn metal quantification and speciation methods (e.g., ICP-MS), data analysis, and interpretation of complex chemical datasets. Through this project, students will build a strong foundation in natural product chemistry, polymer chemistry, and coordination chemistry of rare earth elements. They will gain an understanding of size- and geometry-based selectivity in metal-ligand interactions, bio-inspired materials design, and the principles governing adsorption and separation processes. Students will develop critical literature analysis skills by reviewing and discussing current research on bio-inspired polymers, rare earth element recovery, sustainable separation technologies, and circular economy approaches.</p> <p>Students will strengthen scientific communication skills through preparation of figures, written reports, abstracts, and presentations for group meetings and conferences. Students will be expected to present their work at regular group meetings and have the opportunity to present at conferences, including ISU Research and Creative Works Symposium for the spring semester, Idaho Conference Undergraduate Research (ICUR) at Boise State University for coming years.</p>	No
<p>Land Change Modeler Application for I-CREWS Fort Hall Site</p>	Idaho State University	<p>Keith Weber webekeit@isu.edu</p>	No preference	No preference	<p>I will personally supervisor the student as they acquire and prepare (1) Landsat satellite imagery time series and (2) land cover dataset time series, ideally back to 1980 although that may not be possible due to data availability. The student will use these data in Idrisi Terrset and its Land Change Modeler (LCM) processing module to create a modelled future land cover for southeast Idaho and specifically the Fort Hall Site (FHS) study area. Various time steps forward will be used based on the series of past time steps entered into the LCM model.</p>	No

					Student will learn experimental design satellite remote sensing applications, modeling and forecasting, and most importantly, will experience critical thinking opportunities during the assessment of results.	
1) Development of Cold Atmospheric Pressure Plasma Devices to reduce industrial water use.	Boise State University	Ken Cornell kencornell@boise.state.edu	Full-time preferred I will take part-time if the student is also enrolled in courses or other experiences.	In person	<p>There are three projects in my lab that relate to the development of cold atmospheric pressure plasma (CAP, nonthermal plasmas) technology and its application to water systems.</p> <p>The first project concerns the development of the technology for industrial food processing systems where large quantities of water are consumed in sanitization of food contact systems to reduce foodborne illness and spoilage. In this project students will work on demonstrating that the application of CAP can decontaminate conveyor belts and other industrial surface materials of bacterial pathogens (Salmonella, E. coli O157:H7) that are frequent causes of recalls of processed food products and sources of foodborne illness. Students working on this project will gain skills in microbiology, sterile technique, and chemical analysis of reactive oxygen and nitrogen species. These studies will serve as the basis of translation of this technology to industrial environments.</p> <p>The students working on this project will learn skills across the fields of microbiology, analytical chemistry, spectroscopy, and cell culture. Students will also learn valuable skills in record keeping, data analysis, preparation of presentations (oral, poster), and report writing. The desired knowledge and skills will be taught, but students who are detail oriented and dedicated to working hard will be more successful.</p> <p>**Students need to be available during normal daytime hours, since training will require the efforts of myself and senior students in the lab.</p>	No
2) Cold Atmospheric Pressure Plasma remediation of PFAS contaminated water.	Boise State University	Ken Cornell kencornell@boise.state.edu	Full-time preferred I will take part-time if the student is also enrolled in courses or other experiences.	In-person	<p>The second project involves research into the use of CAP to chemically degrade perfluoroalkyl/polyfluoroalkyl substances (PFAS, "forever compounds") that contaminate water supplies and are of increasing concern due to their ability to accumulate in the environment and potentially cause harmful hormonal dysregulation, developmental effects, and cancer. CAP produces short lived reactive oxygen and nitrogen species that are among the few compounds with the ability to oxidize PFAS into simpler, nonharmful byproducts (like CO₂ and fluoride ion). For this project, students will gain training in a variety of spectroscopies, including UV/Vis, fluorescence, LC/MS, IR, and F-NMR to measure CAP-mediated degradation of PFAS compounds in water. The results of this work will serve as the basis for the development of CAP systems for municipal and industrial water systems.</p> <p>The students working on this project will learn skills across the fields of microbiology, analytical chemistry, spectroscopy, and cell culture. Students will also learn valuable skills in record keeping, data analysis, preparation of presentations (oral, poster), and report writing. The desired knowledge and skills will be taught, but students who are detail oriented and dedicated to working hard will be more successful.</p> <p>**Students need to be available during normal daytime hours, since training will require the efforts of myself and senior students in the lab.</p>	No
3) Elimination of water-borne diseases using	Boise State University	Ken Cornell kencornell@boise.state.edu	Full-time preferred	In-person	<p>The final project involves the application of CAP technology to virus and parasite contaminated water systems. Viruses like Norovirus, and parasites like Giardia intestinalis frequently contaminate water supplies and lead to intestinal illness in humans and animals. The CAP production of reactive oxygen and nitrogen species provides a</p>	No

<p>Cold Atmospheric Pressure Plasma.</p>			<p>I will take part-time if the student is also enrolled in courses or other experiences.</p>		<p>mechanism to oxidize biomolecules on these pathogens that leads to their inactivation, thus preventing their ability to infect hosts. Students working on this project will gain experience in cell culture, sterile technique, microbiology, protein chemistry, and mass spectrometry. This project serves as the basis for the development of this technology to treat water supplies, particularly in isolated or remote systems (ocean vessels, rural wells, etc.) that would benefit from simple treatments requiring only room air and electricity for effective decontamination of pathogens</p> <p>The students working on this project will learn skills across the fields of microbiology, analytical chemistry, spectroscopy, and cell culture. Students will also learn valuable skills in record keeping, data analysis, preparation of presentations (oral, poster), and report writing. The desired knowledge and skills will be taught, but students who are detail oriented and dedicated to working hard will be more successful.</p> <p>**Students need to be available during normal daytime hours, since training will require the efforts of myself and senior students in the lab.</p>	
<p>Elucidating the Molecular Level Mechanism of PFAS Degradation with Cold Atmospheric Pressure Plasma Treatment</p>	<p>Boise State University</p>	<p>Jenee Cyran Jeneecyran@boisestate.edu</p>	<p>Full-time or Part-time</p>	<p>In person</p>	<p>The goal of this proposed research is to elucidate the molecular level details of the impact of plasma treatment on perfluoroalkyl substances (PFAS). Per- and polyfluoroalkyl substances (PFAS) are globally recognized as persistent organic pollutants (POPs) owing to their resistivity to environmental degradation, known as “forever chemicals.” More recently, specific bans on the use of PFAS in manufacturing have been established as a result of links to serious health concerns, including immunotoxicity, developmental toxicity, and several cancers. This research would provide a potential way to degrade and remediate PFAS from our water sources.</p> <p>The student will learn cutting-edge research techniques, such as nonlinear spectroscopy and cold atmospheric plasma. The student will also learn data analysis and coding skills in MATLAB and Python, as well as presentation skills to communicate their science in group meetings and local conferences.</p>	<p>No</p>
<p>Community Engaged Microplastic Sampling in Idaho River Basins</p>	<p>College of Idaho</p>	<p>Rachel Headley rheadley@collegeofidaho.edu</p>	<p>Full-time or Part-time</p>	<p>In person preferred</p>	<p>Microplastics are a pollutant of concern in natural water systems and are clear marker of human influence, both direct and indirect. In order to guide policy on how to control and mitigate microplastic problems, we first need to better monitor and understand their distribution. In Idaho in particular, the transport and collection of microplastics through water systems in our dam-controlled rivers, whether for energy, irrigation, or recreation, is not well connected, and our research intends to directly look at the time and spatial variance of suspended microplastics over these anthropogenic controls on flow in our waterways.</p> <p>We intend to investigate a variety of rivers and drainage basins within SW Idaho. While we expect microplastics to exist most everywhere due to their known range and air borne distribution, we hypothesize that there will be differences among waterways within urbanized, rural, and wilderness drainage basins. We expect to find that more remote samples will tend to show more microplastics from atmospheric transport and precipitation (particularly in the form of fibers) whereas more urbanized waterways will contain more locally sourced microplastics. We also predict that seasonality will lead to variations in microplastic concentration, likely related to climate, geographic context, and anthropogenic control of each specific river basin.</p> <p>We intend to focus our sampling around a two-pronged approach, incorporating community sampling strategies:</p>	<p>Possibly, but not necessary</p>

					<ol style="list-style-type: none"> 1. Continue and expand our sampling in Idaho for both temporal and spatial variation in microplastic pollution. 2. Start up our community research project distributing community science water sampling kits to local recreational facilities. <p>The student will combine field work and lab work within SW Idaho. We will travel around the Boise River and Snake River basin to collect in situ water samples. We will also focus on developing and distributing the community water sampling kits to local river outfitters and processing these samples for both microplastics as well as general water quality. In the lab, the student will process and analysis the microplastic samples, plus measure TSS and related water quality parameters. Additionally, we will work on finalizing FTIR measurements on prior fiber samples from previous years.</p>	
Scaling Photogrammetric and GPS-Based Approaches for Streamflow Monitoring in Natural Channels	College of Southern Idaho	Jeffrey Cooper jcooper@csi.edu	Full-time	In-person (with a minor virtual component)	<p>Research will expand on prior work developing GPS- and photogrammetry-based methods for monitoring open-channel streamflow in natural systems. Building on initial modeling efforts using controlled channel sections, this project will focus on collecting additional field data across multiple stream reaches and flow conditions to improve, validate, and generalize streamflow estimation techniques.</p> <p>This project advances Energy–Water (E-W) systems research by developing scalable, data-driven methods for monitoring streamflow, a foundational variable linking water availability to energy production, agricultural demand, and water infrastructure operations. Improved streamflow monitoring supports resilience in coupled energy–water systems by enabling better forecasting, management, and response to hydrologic variability driven by natural and population changes. The integration of drone-based photogrammetry, GPS, and field measurements directly contributes to data and knowledge flows that underpin E-W system planning and management in the Snake River and Columbia Basins.</p> <p>Students will use drone-based photogrammetry, GPS surveying, and in situ flow measurements to relate stream stage, channel geometry, and surface characteristics to discharge. Emphasis will be placed on evaluating accuracy, repeatability, and efficiency across varying channel morphologies and hydrologic conditions. The project will also explore protocol refinement and data-processing workflows to support scalable, low-cost streamflow monitoring in remote or data-limited watersheds.</p> <p>Student researchers will play a central role in field data collection, data processing, model refinement, and method evaluation. Participants will be responsible for substantial portions of the research and will contribute directly to the development of improved monitoring approaches applicable to tributaries of the Snake River Basin.</p>	Yes (students will drive their own personal vehicle)
1) Orton Botanical Garden community demonstration and education of cold hardy cacti and other succulents, native	College of Southern Idaho Orton Botanical Garden	Deserae Orton ortonbotanicalgardenstaff@gmail.com	Part-time	In-person	<p>Orton Botanical Garden will be actively educating the public through guided tours, classes, plant sales, visitor education of all ages and backgrounds about cold hardy cacti and other succulents, native and drought tolerant plants, environmental health, and resource conservation. The Garden also demonstrates how plants can support and protect pollinators and other wildlife while adding beauty to the landscape.</p> <p>Personal Educational knowledge to be gained:</p> <ul style="list-style-type: none"> • Learn to Identify the plants in OBG that are water wise • Learn to Identify the plants in OBG that are fire wise and fire wise landscaping 	Yes, a 4-wheel Gator John Deer utility vehicle, small and is easy to drive for hauling plants, and tools, and debris.

<p>Idaho and drought tolerant plants, environmental health, pollinator plants, and promoting local water resource conservation.</p>					<ul style="list-style-type: none"> • Describe the soil amendments needed for Twin Falls area • Describe the purpose of soil amendments in water wise landscaping • Understanding the purpose of amending land shapes to encourage water retention at the right rate for desert plants. • Ability to lead a garden tour about high desert and native plants, teaching about the water wise and fire wise qualities. • Ability to educate visitors and customers about the plants, their identification, care and maintenance, as well as water conserving qualities, and soil amendments needed. • Deeper understanding of the limited water resources and the use of high desert and native plant landscaping to conserve water, while promoting beauty, pollinator and bee habitats. <p>Public Educational Experiences project:</p> <ul style="list-style-type: none"> • During OBG plant sales, engage with public about the properties of OBG plants, their water wise properties, their care and maintenance, soil amending needs, pollinator qualities • During OBG public tours, help with plant identification, share educational information on garden water wise landscaping, water wise plants, native plants, reduction of invasive species, educational information about fire wise landscaping • Pruning work, while physical labor is essential, the skill development here is the identification of plants, and proper maintenance to reduce fire risks • Plant propagation, learning to identify plants when in early growth, often as volunteer plants in OBG, and repotting them for use in plant sales to the public or replanting in OBG. Learning how to care and maintain the growth of a botanical garden space. • Helping the public seeking xeriscaping plants, and often touring our garden and wanting the plants OBG has is the best way to educate the public about the qualities of water wise landscaping. • Pollinator plants education, gaining the understanding that one way to influence water wise landscaping is through beauty. Our best pollinator and water wise plants, are beautiful and can entice our public visitors to consider the multi-beneficial impact of our plants and landscaping style. • Working with drip systems, learning about High Desert landscaping, bringing the beauty of our natural environment back to the gardens and yards of the public. • Seed collection, learning to identify seeds, collect seeds and label for future use or sale at OBG. Understand the use of seeds by many in the public to propagate plants that are appropriate for our local climate, and assisting to educate visitors about how to cultivate the seeds. • Helping with public events, local non-profit collaborations, to increase public awareness of high desert landscaping, water-wise plants, and conservation. <p>Desired Knowledge/Skills:</p> <ul style="list-style-type: none"> • Willing to work in the outdoors • Good interpersonal skills • Self Motivated to learn 	
<p>2) Evaluating Cold Hardiness of Range-Edge</p>	<p>College of Southern Idaho</p>	<p>Deserae Orton ortonbotanicalgarde@nstaff@gmail.com</p>	<p>Full – to part time</p>	<p>See details in description</p>	<p>This study investigates the cold hardiness of range-edge populations of <i>Larrea tridentata</i> collected from southern Nevada and New Mexico. Plants will be established in a common garden in Twin Falls, Idaho, and subjected to controlled winter exposure treatments. Survival, winter injury, and post-winter growth will be compared between</p>	<p>Truck capable of pulling a small trailer. The truck will</p>

<p>Populations of Larrea Tridentata via Experimental Transplantation to a Southern Idaho Garden</p>	<p>Orton Botanical Garden</p>		<p>(See additional details in description)</p>		<p>greenhouse-protected and outdoor-exposed groups. Results will evaluate the species' potential for survival beyond its current climatic range. Therefore, the study evaluates the feasibility of cultivating Larrea tridentata in colder climates, and outcomes will inform both ecological understanding of cold tolerance and potential horticultural applications.</p> <p>The position will be full time for 14 days, considering driving time, harvesting of plants, transportation back to Idaho, and immediate planting. There will likely be no days off during this time period because a quick transplantation process is essential for plant survival, and it may take up to 160 hours over 14 days. After that, maintenance is a very part-time job, less than 4 hours per week. Most of the time during the summer would be spent collaborating with CSI and/or ISU faculty and writing up research manuscripts. A portable tent greenhouse will need to be set up in the late fall and dismantled in the Spring, and I am willing to do that on my own time if funds for labor run out. Most of this will be in person, but collaboration with ISU faculty will be virtual.</p> <p>The student will be learning the implementation of the research process, independent/dependent variables, and plant ecology measures.</p> <p>Our research directly supports the energy–water nexus by evaluating whether Larrea tridentata (creosote bush), one of the most drought-tolerant shrubs in North America, can be successfully established in southern Idaho. If viable, this species represents an extremely low-water landscaping option compared to traditional ornamental plants commonly used in the region. By reducing irrigation demand in residential and public landscapes, this work contributes to decreased water withdrawals from the Snake River system. Because water availability directly influences hydroelectric generation capacity in southern Idaho, reducing non-essential water use—such as landscape irrigation—can help preserve flow levels critical for energy production.</p> <p>In addition to water conservation, this research has indirect energy-saving implications. Landscapes dominated by drought-tolerant species require less pumping, treatment, and distribution of irrigation water, all of which are energy-intensive processes. Furthermore, replacing high-input ornamental plants with desert-adapted species reduces upstream energy costs associated with plant production, transportation, and maintenance. By identifying plant materials that can survive Idaho winters with minimal inputs, this project supports the development of sustainable landscaping practices that reduce both water consumption and embedded energy use, aligning closely with SARE's goals of improving efficiency and resilience in coupled water–energy systems.</p> <p>Looking ahead, this research may also inform long-term land management strategies in Idaho's high desert environments. If cold-tolerant populations of Larrea tridentata demonstrate successful establishment, there may be potential to explore their role in stabilizing arid landscapes currently vulnerable to invasive, fire-prone species such as cheatgrass. While any such application would require careful ecological evaluation and regulatory oversight, establishing deep-rooted, drought-adapted perennial shrubs could contribute to reduced fine fuel loads, improved soil stability, and increased resistance to noxious weed encroachment. These outcomes have implications for wildfire mitigation and ecosystem resilience, which in turn affect water retention, land productivity, and the protection of infrastructure tied to regional energy systems. In particular, reducing wildfire frequency and intensity can help protect transmission corridors, irrigation systems, and hydroelectric infrastructure from damage, further strengthening the reliability of interconnected energy and water resources.</p>	<p>either be a rental or possibly one from the Orton Botanical Garden.</p>
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1) Water System Impacts of Biting Black Fly Surveillance and Control in South-Central Idaho	College of Southern Idaho	Brian Simper bsimper@csi.edu	Full-time	In person preferred	<p>This project proposes to place two undergraduate interns with the Twin Falls County Pest Abatement District to conduct applied research focused on biting black fly surveillance and control within irrigation canals, rivers, and associated water delivery systems in south-central Idaho. Interns will collect field data, evaluate treatment strategies, and analyze environmental variables influencing black fly populations.</p> <p>The work directly supports the mission of the Idaho Community-engaged Resilience for Energy-Water Systems (I-CREWS) initiative by examining how biological threats interact with managed water infrastructure and by generating data that can improve the sustainability and efficiency of these systems.</p> <p>Undergraduate interns will participate in authentic, hands-on research experiences that integrate biological science with water systems management. Activities will include:</p> <ul style="list-style-type: none"> • Conducting larval and adult black fly surveillance • Mapping breeding locations within canal and river systems • Monitoring water velocity, temperature, and habitat conditions • Assisting with environmentally responsible treatment applications • Evaluating treatment effectiveness using collected datasets • Developing recommendations to improve operational efficiency <p>Students will gain experience in field research, data analysis, GIS mapping, and science communication while working alongside pest management professionals.</p>	Yes, pickup trucks
2) Using UAS Multispectral Imaging to Identify Mosquito Habitat and Improve Water Management in Arid Landscapes	College of Southern Idaho	Brian Simper bsimper@csi.edu	Full-time	In person	<p>This project proposes to place two undergraduate interns with the Twin Falls County Pest Abatement District to conduct applied research using unmanned aerial systems (UAS) equipped with multispectral sensors to identify standing water and saturated soils in arid environments that may serve as habitat for vector-carrying mosquitoes. Interns will collect aerial imagery, map and measure fields using RTK technology, analyze vegetation and moisture indices, and develop geospatial products that support proactive water management, mosquito surveillance, and targeted treatment strategies.</p> <p>The two interns selected will participate in authentic research that combines drone technology, environmental science, and water systems analysis. The interns will plan and conduct UAS multispectral missions to collect data. They will scout and mark the fields to compare data collected by UAS to what is actually on the ground. The potential for integrating imagery into GIS platforms is anticipated and hopefully developing recommendations for long-term monitoring and water saving strategies</p> <p>** Students will need a Part 107 UAS Certificate, or be interested in obtaining a Part 107 UAS Certificate to conduct drone work.</p>	Yes, pickup trucks
Reducing Codling Moth Populations in the Magic Valley Using Sterile Insect Release	College of Southern Idaho Mid Snake Resource Conservation and Development Council	Heidi Tubbs midsnakercd@gmail.com	Part-time	In-person	<p>Mid Snake Resource Conservation and Development Council (RCD) is conducting a research project that seeks to mitigate the economic impact of codling moth damage to apple and pear trees by locating orchards throughout the valley (commercial, backyard, and lone trees), monitoring the presence of codling moth through trapping, and then releasing sterile male codling moths into infected orchards weekly during the season to mate with wild moths, reducing their population and economic impact utilizing a biological control. Targeting trees throughout the valley instead of just individual orchards should result in greater reduction and decrease the occurrence of re-infestation as compared to targeting individual orchards.</p>	Student will be reimbursed for driving personal vehicle

					<p>The use of biological controls in place of chemical applications in agricultural operations can significantly reduce the amount of ag-related chemicals finding their way into ground and surface water, as well as decreasing the energy needed to apply these chemical controls. Sterile insect release has been shown to be effective in other states having large orchard blocks, we are looking at the effectiveness in Southern Idaho with small blocks and lone trees.</p> <p>The SARE student will be expected to assist with making connections with individuals and orchard owners participating in the study, place and monitor moth traps throughout the season, release the sterile moths weekly in the study areas, compile data, and assist with creating and presenting data to community leaders, industry partners, and interested community groups.</p>	
<p>Groundwater Monitoring of New Wells to Assess Water Quality and Treatment Energy Needs</p>	<p>College of Western Idaho</p>	<p>Emily McIntier emilymcintier@cwidi.edu</p>	<p>Full-time or Part-time</p>	<p>In-person</p>	<p>This project will investigate groundwater quality in three newly developed wells at the College of Western Idaho in Nampa to establish baseline conditions and assess variability across sites. Students will analyze key chemical parameters and evaluate how water quality influences treatment needs. In collaboration with regional partners such as the Idaho Department of Health and Welfare, the project will connect local water monitoring to broader public health and water-energy system challenges. This work will generate foundational data while training students in applied environmental chemistry.</p> <p>Students participating in this SARE project will engage in hands-on field and laboratory research focused on groundwater quality assessment. They will collect water samples from newly developed campus wells, perform chemical analyses (e.g., pH, conductivity, nitrate, hardness, and heavy metals (if feasible)), and apply quality assurance/quality control practices used in environmental chemistry. Students will analyze and interpret their data to compare water quality across wells and evaluate implications for water treatment. This opportunity is designed to engage college students in authentic research experiences that build confidence and pathways into STEM careers.</p>	<p>No</p>
<p>Wildfire Smoke - Risks in Idaho Communities</p>	<p>Lewis Clark State College</p>	<p>Nancy Johnston najohnston@lcsc.edu</p>	<p>Full-time or Part-time</p>	<p>In-person</p>	<p>Energy-water systems are under stress in Idaho due to warmer climates and drought in the summers, and may result in increased wildfires. Wildfire smoke can place communities at risk to air toxics and particulate matter. This project measures 1) the frequency of wildfires related to drought conditions 2) the concentration of air particulates and air toxics in Idaho wildfire smoke 3) the subsequent risk of these air exposures to communities. This project's outcomes will help communities plan and become resilient during these times of environmental change, aligning with I-CREWS's mission for Community-engaged Resilience for Energy-Water Systems.</p> <p>Students will be involved in community air sampling during background and wildfire seasons in Idaho to determine the exposure risk due to emitted air toxics. Students will learn the following skills: field air sampling, analysis of air samples, quality data control, air toxic calculations and data workup, statistical and graphical analysis, preparation of presentations and publications. General chemistry is helpful but not required. Some laboratory experience is preferred.</p>	<p>No</p>