

# Wyoming Reclamation and Restoration Center

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The Wyoming Reclamation and Restoration Center (WRRC) functions as a critical research, extension, and education focal point at the University of Wyoming and bridges the academic mission of the University with needs of the State of Wyoming. The past year has seen significant change in the Center as well as research and outreach success. The Center relies primarily on external and foundation funding to perform its mission and does not receive direct funding from the University block grant.

In response to a proposal to eliminate the WRRC, a committee was formed to create a proposal to re-orient the Center and prepare it for future success. Dr. Peter Stahl, longtime Center Director, elected to retire in 2021, which will both create challenges for the immediate management of the Center and opportunities for new leadership. The committee delivered a successful proposal to Academic Affairs with a plan to reorganize the Center. According to the plan, the Center will be reorganized during Fall semester, 2021 along the following guidelines. The Center will be renamed the “Center for Ecological Restoration” to more widely reflect the research and outreach activities in the Center. A new Director will be identified and charged with engaging faculty, staff and students to increase research, education, and extension activities across campus and the state. The Center will intentionally build partnerships to facilitate interdisciplinary activities, catalyze research in Wyoming through engagement, and build stronger connections between stakeholders in the state and interested parties in the University. One of the mandates given to the incoming Center Director will be to increase connections across the state and raise nontraditional extramural funding to support student projects as well as research and extension activities

The WRRC was originally formed in recognition of the significant gaps in science needed to effectively restore ecological functions of disturbed lands. Center-affiliated faculty and students have made great contributions to this discipline and take pride in facilitating the recovery of Wyoming landscapes after they have been disturbed. It is clear that there is still a lot of work to be done in the field of drastically disturbed land reclamation and restoration. It is also evident that significant opportunities for restoration-related research should be added to the Center’s portfolio, and by refocusing on emerging issues the Center will be well positioned for success in competitive grants and securing foundation funding from regional patrons. Specifically, we aim to broaden the Center to come into alignment with the College and Universities emerging research initiatives by highlighting ecological restoration with a focus on the assessment, management, and restoration of healthy soils and plant communities in Wyoming’s managed ecosystems.

The WRRC has served, and will continue to serve, a valuable role in increasing the scientific knowledge and technical transfer relating to the

reclamation and restoration of disturbed lands. The proposed changes are intended to modernize the Center, increase interdisciplinary activities on campus, increase extramural funding, and support student learning. Wyoming is an optimal field laboratory for restoration research with excellent industry partners, and the University intends to provide leadership in the restoration of its magnificent environment. We have outstanding faculty expertise across campus, and a revitalized Center for Ecological Restoration will serve to magnify impact and serve an important role in facilitating partners in the sustainable management of their resources.

With respect to funding and research activities in 2021, research activities were primarily focused on the role of coalchar as a soil amendment for improved soil and ecosystem health in degraded lands. This project received approximately \$100k via a grant administered by the School of Energy Resources. Field research was re-initiated in 2021, after being dormant in 2020 due to the COVID-19 pandemic. Center research leveraged field sites at the UW Agricultural Experiment Stations in Powell and Lingle (Powell and SAREC R&E Centers) and partnered with faculty in Ecosystem Science and Management, Agricultural and Applied Economics and SER. Three graduate students were supported either directly or indirectly by the Center. One graduate student (Resham Thepa), graduated with an MS in Spring, 2021 after investigating the economic feasibility of coalchar as an amendment, and then started a PhD in Soil Science. Another student (Bouzeriba Alsnuse), received funding from the LIFE program and contributed to the research effort. A third PhD student (Samir Budathoki) joined the University in Fall, 2021 to work on this project.

The objectives of the current project year in regard to research on use of pyrolyzed coal or coalchar as a soil amendment were a) observation of soil and plant responses to treatments included in our rangeland soil trials of coalchar at SAREC and b) initiation of additional field trials to determine the influence of coalchar treated with cow manure as well as terrestrial algae on growth of a crop plant, sugarbeet, and soil quality at the Powell Research and Extension Center in Powell, WY and corn and soil quality at SAREC near Lingle (again, both compared to biochar). Because of the shutdown of research activities at the University of Wyoming Agricultural Experiment Stations due to the Covid-19 problem in mid-March, planned field trials with crop plants at SAREC and Powell could not be initiated in 2020, but were taken in 2021. Field results have not yet been fully analyzed for 2021, but previous research (2018, 2019) yielded positive effects, a large increase in forage productions was observed between 2018 and 2019 indicating good development of rangeland species planted on research plots.

Field visits to the landfill in Jackson, Wyoming, were undertaken in 2021 to explore the potential for research into the reclamation of landfill sites. During this exploratory visit several samples were taken and are awaiting analysis. The Center will continue to explore research with traditional research partners while exploring new avenues for research, partnership, outreach, and technical transfer.