

EPSCoR Funding Impacts in Wyoming



EPSCoR Track-1 RII Current and Ongoing Successes

- The Wyoming Center for Environmental Hydrology and Geophysics (WyCEHG) was created as a center of excellence. WyCEHG has transformed science and watershed management by providing cutting-edge knowledge and tools to water resource managers in the public and private sectors. The multidisciplinary center encompasses new physical and intellectual infrastructure that enables a comprehensive research program linking surface and subsurface watershed hydrology, geophysics, remote sensing, ecology, and computational modeling. All of these disciplines feed a state-of-the-art data discovery tool that provides data from WyCEHG to the public and a platform for many other disciplines to disseminate their data. Funding from this project has supported 57 PhD students, 58 Masters students, and 263 undergraduate students. As a result of this project, 96 publications have been produced, including one featured in *Science*. WyCEHG investigators have obtained 52 successful external awards totaling \$12,263,564.
- In 2005, a RII grant established the nationally prominent UW Stable Isotope Facility (SIF), which provides demonstrably high-quality isotopic analyses for the UW and world-wide research communities. UW SIF offers a hands-on teaching and research facility for UW students, postdocs and faculty and has been sustained by continuing state and national funding sources.
- For over 20 years, state and national funding continues to support the Wyoming Geographic Information Science Center (WyGISC) as a premier interdisciplinary institute at UW focused on research and development, education, and outreach associated with geospatial information representation, access, visualization, analysis and modeling.



EPSCoR Track-2 RII Success

- A \$6 million, four-year award to Wyoming and Utah ending in 2015 (CI-WATER; CyberInfrastructure to advance WATER research) increased access to data- and advanced computationally-intensive watershed modeling. CI-WATER high-resolution watershed models offer an in-depth understanding of the interconnectivity of natural and human water resources systems. The computational investments are used by researchers and students in all STEM fields at UW.
- A collaborative project among three institutions in Montana, Wyoming, and South Dakota began in 2017 and focuses on developing a framework of CO₂ mitigation scenarios that do not create conflicts with food security and production of clean energy. The 4-year, \$6 million project will offer novel experimental insights, modeling tools, and technological solutions for improving the resiliency of food security and ecosystem services to global climate policies.
- A 4-year collaboration project among four institutions (Jackson State University, University of Mississippi, University of Delaware, and the University of Wyoming) in three states will



develop methods to convert biomass into energy involving burning in the presence of oxygen (combustion), reaction at high temperature with controlled amount of oxygen and /or steam (gasification), and decomposition at elevated temperature in the absence of oxygen (pyrolysis). This project focuses on biomass pyrolysis to produce fuels and biochar and then chemically modifies biochar for use in applications related to carbon dioxide capture, water purification, and food production.

Workforce Development

- Wyoming EPSCoR prioritizes improving STEM education at the high school, community college, undergraduate, and graduate levels. Since 1992, funding from Wyoming NSF EPSCoR has supported more than 1,000 undergraduate students as EPSCoR research fellows, 371 high school students in the Summer Research Apprentice Program (SRAP), and 177 community college students with the Wyoming EPSCoR Community College Awards. These efforts have become a model for the Science Initiative to which the Wyoming legislature has appropriated over \$100 million beginning in 2015.

Outreach

- Wyoming EPSCoR has established a satellite office at the Wind River Indian Reservation with a full time staff member to coordinate STEM education efforts. The office has provided teacher resources for water-science and STEM education, outdoor classroom development, and community engagement to 90 teachers and 530 students.
- WyCEHG supports 13 faculty researchers and 40 community college students through the Community College Research Program (CCRP), Community College Transfer Program (CCTP), and the Community College STEM (CC-STEM) programs.
- WyCEHG works bidirectionally with state and regional water managers to provide cutting edge watershed science and develop tools and intellectual capacity to address issues raised by water managers. Three Water Interest Group (WIG) meetings have been held with over 100 scientists, water managers, and policy makers in attendance.



NSF EPSCoR RII AWARDS

| YEAR | Track 1 Amounts | Track 2 Amounts |
|-------------|--------------------------|-------------------------|
| 1986-2009 | \$23.6 million, 5 awards | |
| 2011-2017 | \$20.0 million, 1 award | \$4.8 million, 3 awards |