NEVADA SYSTEM OF HIGHER EDUCATION March 2010

Nevada EPSCoR

Experimental Program to Stimulate Competitive Research

New Mexico and Idaho Join Nevada to Tackle Climate Change

Enhanced cyber interconnectivity expected to stimulate collaboration

The National Science Foundation's (NSF) Experimental Program to Stimulate Competitive Research (EPSCoR) has announced a three-year award of $6 million to be shared equally by the tri-state consortium of Nevada, New Mexico and Idaho to enhance cyber interconnection at its higher education institutions with a goal to transform climate change research in Nevada.

Improvements will increase sharing of data and information within and across the three states that will allow researchers to collaborate seamlessly on climate change issues. Consortium data and information ultimately will become accessible to the broader community of environmental scientists, decision makers, students, and the public. Furthermore, the award will provide local middle and high school students and teachers with opportunities in cyber-enabled learning, along with climate change curriculum tools and materials.

"The NSF cyberinfrastructure award will enhance the ability for the tri-state consortium to better address 21st century grand scientific and societal challenges related to climate change," says Nevada NSF EPSCoR Project Director Gayle Dana, lead "Research efficiencies and collaboration will boost exploration, experimentation and innovation in Nevada climate change research. In addition, the award will increase our state's competitiveness for further research funding and help Nevada sustain research partnerships with other states."

The cyberinfrastructure investments complement the scientific and educational benefits resulting from $15 million NSF EPSCoR awards on climate change, one each awarded to Nevada, Idaho, and New Mexico in 2008.

Nevada's climate change project is being led by Nevada System of Higher Education faculty from the University of Nevada, Las Vegas (UNLV); University of Nevada, Reno (UNR); and Desert Research Institute (DRI) to examine climate change and its effect on Nevada. Increased information in this area will lead to better informed decisions by the public and policy makers regarding climate change and provide further education on the subject.

Nevada Student and Fellow Get Involved

Jenna Zulauf
UNLV Sociology Student

Zulauf has collected data on college students' attitudes, perceptions, knowledge and current action toward climate change – a prerequisite to her larger goal of conceptualizing an educational exhibit designed to generate discussion and awareness about the causes and consequences of climate change in the region.

Her interests focus on the integration of science into a social world, and the pathways and obstacles toward change. "The climate change project demonstrates a genuine concern for Nevadans' stake in direction of policy," she says.

John Mejia
DRI Climate Modeling Fellow

Mejia insists on teaching his students to think scientifically and independently so they feel confident taking risks in their projects and careers. "My goal as a teacher is to engage students," he says.

His projects involve helping improve the application of climate models by facilitating an understanding of the intricate interactions associated with deriving regional climate information based on large-scale climate conditions. He is currently implementing regional climate models as a tool for projecting future climate conditions at regional and sub-regional levels. His emphasis is on extreme weather events such as droughts and floods and regional climate variability.

About Nevada EPSCoR

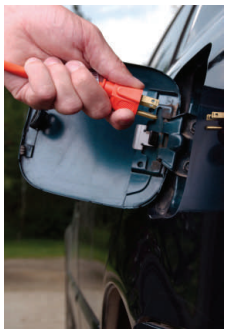
EPSCoR builds the scientific research capacity in states that receive less than one percent of federal research funds.

Nevada qualifies as one of 27 states plus Puerto Rico and the U.S. Virgin Islands that benefits from EPSCoR support. State initiatives focus on faculty, students and national laboratory collaborations.

Federal agencies currently funding Nevada EPSCoR programs include: National Science Foundation, National Aeronautics and Space Administration, and Department

Batteries for Electric Drive Vehicles

DOE EPSCoR
PI: Alan Fuchs
University of Nevada, Reno



The Nevada DOE EPSCoR project is important to Nevada's research because it focuses on developing and evaluating a new generation of ionic conducting membranes for electric drive vehicles.

Vehicle batteries are unique because they must perform in a wide range of temperatures, have a high energy density, recharge quickly, have a long service life, have slow self discharge rate, and when installed in a vehicle be price competitive with a gasoline power vehicle.

A 2010 proposal submitted to DOE EPSCoR aims to fund research to discover novel membranes that produce batteries with improved performance for use in electric and hybrid vehicles. A collaboration, at UNR, UNLV and DRI, will focus on the use of supramolecular polymer chemistry and surface polymerization to develop membranes with controlled phase separation to optimize their electrochemical properties as vehicle battery membranes.

Exploring Planetary Surfaces: Earth, Moon and Mars

NASA EPSCoR
PI: Wendy Calvin
University of Nevada, Reno

One of Nevada NASA EPSCoR's project goals is to develop terrestrial and planetary sites where surface processes can be explored both virtually and in the field. Teams are currently developing databases at numerous terrestrial sites including Leviathan Mine (Meridiani analog), Atacama and Mojave Desert (endolith communities and biological soil crusts), Lunar Crater, NV (GPR, soil, and aeolian processes). Potential new study sites (for hypolithic and endolithic) also have been documented in eastern Nevada.

Multiple remote sensing data products as well as in-situ sampling have occurred at these sites. Data and analysis are being compared to current and future Mars orbital and landed missions. Team members from UNR, DRI and UNLV are working collaboratively together across the state.

Nevada Astrophysics

NASA EPSCoR
PI: Stephen Lepp
University of Nevada, Las Vegas

Faculty from UNLV have begun using the NASA EPSCoR grant to build Astrophysics in Nevada.

Since last year, the Nevada Astrophysics team has completed three separate studies relevant to astrophysics and fusion research.

Preparations for the publication of these results are underway. The measurements were carried out by two graduate students: Chrysanthos Kyriakides and Bradley Clarke. Both students are supervised by Professor Kwong, PI of the laboratory astrophysics project. Kyriakides is a Ph.D. candidate, expected to graduate in spring 2010. Kyriakides' investigations include deuterium abstraction with H_2O^+ ions and H-D substitution in H_2DO^+ ions. In both cases, the rate coefficients are found to be relatively large. These results may have interesting implications in the modeling water on the atmosphere of Mars.

Clarke joined the Physics M.S. program in fall 2009 to investigate the cooling mechanism of stored ions in a Paul trap by a supersonic He jet. His investigation may lead to a simple cooling mechanism and is prompting potential further study.

Visit www.nevada.edu/epscor for more information about our programs.

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