Nevada EPSCoR
Experimental Program to Stimulate Competitive Research

Scientists to Research Effects of Climate Change in Nevada

Climate change affects the globe's diverse environments in different ways. In Nevada, limited water resources and delicate desert ecosystems are at risk.

In September 2008, the National Science Foundation awarded the Nevada System of Higher Education $15 million to delve into the unique challenges climate change presents to the arid state.

With a goal to guide land and water decisions and policy, scientists from the Desert Research Institute; University of Nevada, Las Vegas; University of Nevada, Reno; and Nevada State College will implement the five-year project, focusing on:

- Climate Modeling
- Ecological Change
- Water Resources
- Policy, Decision-Making and Outreach
- Cyberinfrastructure
- Education

Climate Modeling
Scientists will model climate change at regional and sub-regional scales to predict effects of various future climate scenarios on ecosystems and resources.

Ecological Change
Disturbance regimes upset the sensitive balance of ecosystems. Scientists will analyze how these phenomena affect the complex desert ecosystem.

Water Resources
Enhanced data collection, modeling and visualization infrastructure will help scientists better quantify and model changes in water balance and supply.

Policy, Decision-Making and Outreach
Scientists will assess how climate change impacts human beings, institutions and society as a whole and determine how to enhance policy making and community education about climate change issues.

Cyberinfrastructure
Data portals and software frameworks will support interdisciplinary climate change research via integration of data from observational networks and modeling.

Education
Educational infrastructure will provide a wide range of outreach and diversity activities, including: a K-12 program focused on at-risk, in-service middle school teachers to enhance STEM (science, technology, engineering and math) education; recruitment of diverse faculty; undergraduate- and graduate-level classes and a graduate certificate in climate change science; undergraduate research scholarships; graduate research fellowships; and postdoctoral research opportunities.

EPSCoR Students Make Their Mark

Through his EPSCoR-funded graduate Research, **Rajan Chakrabarty** has improved understanding of aerosol radiative properties as they relate to global climate change.

Chakrabarty is now a postdoctoral Research Associate at Nevada's Desert Research Institute.

"[EPSCoR support] has provided me with ample time and opportunity to learn from mistakes and at the same time help me clearly identify my strengths," he says.

Amanda Williams is a student at the University of Nevada, Las Vegas, a year and a half away from completing her dissertation in soil conservation and desert ecology.

Her work will help Nevada understand fragile Mojave Desert ecosystems and allow land managers to make more informed decisions.

Williams switched to a doctoral program when she received an EPSCoR graduate fellowship. "[This support] has allowed me to make such tremendous gains on my research," she says. "Had it not been for EPSCoR, I would not be where I am right now."

Williams photo—courtesy of Marsh Starks, UNLV

About Nevada EPSCoR

First established by the National Science Foundation (NSF), the Experimental Program to Stimulate Competitive Research (EPSCoR) builds the scientific research capacity in states that receive less than one percent of federal research funds.

Nevada qualifies as one of 26 states that benefits from EPSCoR support. State initiatives focus on faculty, students and national laboratory collaborations.

Federal agencies currently funding Nevada EPSCoR programs include: NSF, National Aeronautics and Space Administration (NASA), Department of Defense (DoD) and Department of Energy (DoE).

These agencies focus on STEM disciplines, and the EPSCoR initiatives directly meet Nevada's needs.

Department of Defense

The "Virtual At Sea Training" project at the University of Nevada, Reno (UNR) has provided seed funding for strengthening DoD research in military training simulations and computer gaming.

Since this project has been funded, the Computer Science and Engineering Department at UNR developed a minor in Digital Interactive Games and hired two additional faculty in this important research area.

EPSCoR research applies computer gaming to military training.

Department of Energy

Project collaborators from University of Nevada, Las Vegas and Harry Reid Center for Environmental Studies, the Desert Research Institute, and University of Nevada, Reno provide research to enhance the basic scientific understanding of contaminant behavior on surfaces with significant implications to the management of DoE sites.

Research from the Nevada EPSCoR program has directly resulted in two awards for synchrotron beam time at the Advanced Photo Source at Argonne National Laboratory. These experiments expand understanding in fate and transport as well as forensic analysis.
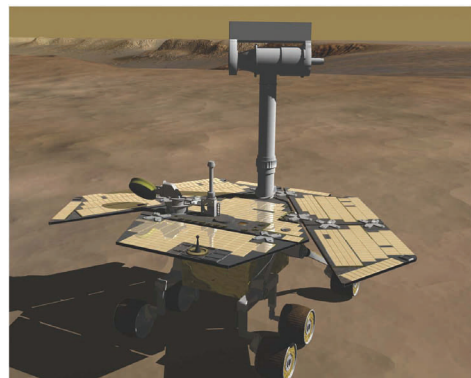
National Science Foundation

NSF sponsored the first EPSCoR program in Nevada. Since 1985, NSHE institutions have received more than $41 million in federal funds from NSF EPSCoR.

These awards have supported program research in bioinformatics, chemistry, chemical physics, laser physics, insect and plant molecular biology, quaternary science, bridge engineering, plants and global climate change, and women in science and engineering.

National Aeronautics and Space Administration

The National Aeronautics Space Administration's (NASA) Exploring Planetary Surfaces Program combines strengths of Nevada researchers in the fields of geomorphology, geology, biology, remote sensing and computer visualization. The project mission involves developing terrestrial and planetary sites where surface processes can be explored.

Virtual field labs will immerse viewers into Mars Exploration Rover terrain via a virtual reality environment where images are directed to four or six walls of a room-sized cube. Data synthesis will maximize future return from present and future robotic probes and aid in training students and future mission teams to make informed decisions on navigation and to understand landscape evolution.

Computer-generated imagery shows "Opportunity," Mars Exploration Rover (Mer), inside the Victoria Crater.

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Visit www.nshe.nevada.edu/epscor.