



Innovative research to achieve water efficient and environmentally friendly solar power

SOLAR ENERGY-WATER-ENVIRONMENT NEXUS PROJECT

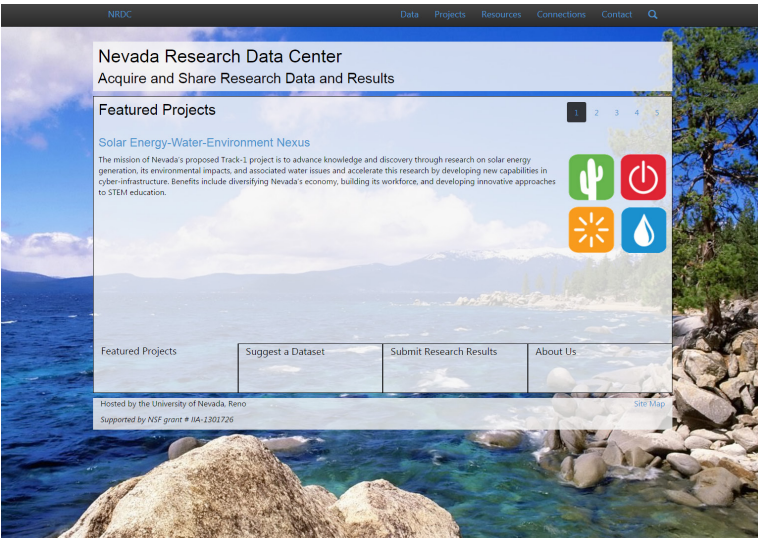
Development of renewable energy resources is a national priority, and Nevada is aligning its research and development activities in support of this important national goal. The Solar Nexus project (for short) is funded by the National Science Foundation (NSF) Experimental Program to Stimulate Competitive Research (EPSCoR) at \$20 million (federal dollars) plus \$4 million (state dollars). The project began June 1, 2013 and ends May 31, 2018.

- Three quarters of electricity production in the U.S. is from fossil fuels, which generate one third of total U.S. greenhouse gases and increase dependency on global markets.
- Harnessing renewable energy, such as solar, could supply all the energy the U.S. needs.
- The abundant solar flux in Nevada makes it one of the best sources for solar energy generation in the world, and development of this energy source has potential to significantly diversify the economy of the state.
- Any substantial harvesting of solar energy must consider its collateral impact on Nevada's scarce water resources and sensitive desert environment.
- In order to sustain and grow the solar energy industry, Nevada needs advanced cyberinfrastructure and an educated and diverse workforce.

UNDERSTANDING THE NEXUS - OR LINKAGES - AMONG SOLAR ENERGY DEVELOPMENT, LIMITED WATER RESOURCES, AND FRAGILE ENVIRONMENTS IS KEY TO ACHIEVING BENEFITS FROM SOLAR ENERGY IN NEVADA AND THE U.S.

The Solar Nexus project is enabling an interdisciplinary team of 180 scientists, engineers, and educators from the University of Nevada, Las Vegas, the University of Nevada, Reno, and the Desert Research Institute to develop research and workforce development to support solar energy development in Nevada.

RESEARCH



Nexus Research Topics

The Solar Nexus project is conducting research in five interrelated science and engineering areas:

1. Improve and develop innovative technologies to minimize water use at solar energy facilities;
2. Determine desert ecosystem responses to the development of solar energy facilities;
3. Develop sustainable water/wastewater approaches to support water needs for solar energy generation;
4. Improve the development and reliability of renewable energy and solar energy supply with new interdisciplinary approaches; and
5. Accelerate the Nexus research with new and existing CI capabilities including advanced data services, real-time data streaming and visualization, data mining and analysis, image processing, data security, and cloud computing.

Nevada's Science and Technology Plan

The project is in line with Nevada's Science and Technology Plan (developed by NSHE and adopted by the Board of Regents), which identifies these priority areas for Nevada:

Natural Resources Alternative and Clean Energy

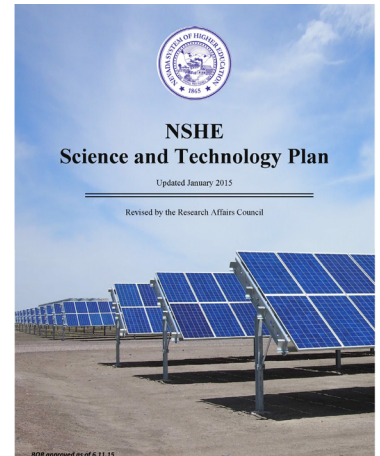
- Climate Change
- Water Resources

Human Health Care Access and Research

- Public Health
- Aging Services

Infrastructure and Technology Transportation

- Materials Science
- Biotechnology
- Information Technology



WORKFORCE DEVELOPMENT & EDUCATION, DIVERSITY, OUTREACH

Workforce Development and Education

The Solar Nexus project is developing a sustainable Science, Technology, Engineering, and Math (STEM) workforce by creating a pipeline of STEM-trained students, educators, and workers through a number of activities, including:

- Graduate student training
- Undergraduate Opportunities Research Program
- K-12 teacher professional development
- High school student research experience programs
- STEM career opportunities programs for high school students



Diversity

The Solar Nexus Project is working to increase the diversity of Nevada faculty and students in STEM with the following approaches:

- Nexus Advisory Committee for Broadening Participation
- Outreach to the Nevada's community and state colleges
- Nevada STEM Pipeline (<http://nvstempipeline.org>)
- Nevada STEM Mentor Network (<https://epscorspo.nevada.edu>)
- New Faculty Leadership Training



Outreach - External Engagement

The Solar Nexus Project is enabling Nevada scientists to collaborate and develop relationships with industry, institutions, and the public to strengthen research that will support the economic development of Nevada.



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**WANT TO FIND OUT MORE?
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