

RAGGIO RESEARCH CENTER

2015 SUMMARY & ANNUAL REPORT



The Raggio Research Center at a Glance

RRC Grants	Main Project Home
<p>EPSCoR grants - (Experimental Program to Stimulate Competitive Research) EPSCoR programs include:</p> <p>CLASSP - (Cyber-Learning Activities to Scaffold STEM Practices)</p> <p>The Solar Energy-Water-Environment Nexus in Nevada :</p> <p>SCIP - (STEM Career Investigation Program)</p> <p>NERDS- (Nevada Educators Really Doing Solar)</p>	<p>Raggio Research Center</p>
<p>HEAT - (Hot Environments, Animals and Temperatures) Desert Birds program, a NASA grant</p>	<p>Raggio Research Center/Geography</p>
<p>NNELI - (Northern Nevada English Learning Initiative) a USDOE grant</p>	<p>Raggio Research Center</p>
<p>Project ReCharge - an ITEST grant (Innovative Technology Experiences for Students and Teachers) through the NSF</p>	<p>Raggio Research Center</p>
<p>RIETI Summer Professional Development program, an NSF grant</p>	<p>Geography/Raggio Research Center</p>
<p>SAP - (Scholarly Activities Pool) award</p>	<p>Raggio Research Center/College of Education-Dean's Office</p>
<p>SETIF - (State Educational Technology Implementation Fund) grants evaluation, through the NDE</p>	<p>Raggio Research Center</p>
<p>SETNA - (State Education Technology Needs Assessment) through the NDE</p>	<p>Raggio Research Center</p>

The Raggio Research Center (RRC) for Science, Technology, Engineering and Mathematics (STEM) Education was created in the College of Education at the University of Nevada, Reno in 1997 as an educational outreach and training facility for primarily STEM education and STEM fields. outreach and training facility for primarily STEM fields.

Mission Statement and Goals

Mission Statement

The Raggio Research Center for STEM Education in the College of Education at the University of Nevada, Reno advances the theory and practice of science, technology, engineering and mathematics (STEM) education through collaborative research, development, instruction, dissemination, leadership and outreach.

Our Goals

1. Conduct cutting-edge research on STEM education at the highest level on questions of state and national importance as applied to Nevada's needs.
2. Recruit and promote STEM education opportunities for all students at all levels in formal and informal educational settings.
3. Actively promote STEM education opportunities for traditionally underrepresented populations as specified by the Next Generation Science Standards as: Economically Disadvantaged, Race and Ethnicity, Students with Disabilities, English Language Learners, Girls/Women, Alternative Education, and Gifted and Talented students.
4. Conduct professional development for better integrated STEM teaching PK-20.
5. Form interdisciplinary research teams of STEM content including university faculty, staff, graduate students, and undergraduate students together with teachers to develop, deliver, and assess/evaluate programs and activities.
6. Serve as an interdisciplinary education center to develop research-rich experiences for pre-service and in-service teachers to deepen and enhance STEM concepts and pedagogy.
7. Develop outreach activities and programs for students of all ages to support knowledge acquisition in the STEM disciplines.
8. Disseminate standards-based and scientifically supported research and information on STEM education.

Message from the Executive Director



***David T. Crowther, Ph.D., Executive Director
Raggio Research Center for STEM Education***

Welcome to the annual report for the Raggio Research Center (RRC) for Science, Technology, Engineering and Mathematics (STEM) Education in the College of Education at the University of Nevada, Reno.

This report is an update on our current grants, projects, and collaborations, our dedicated staff, and the services we offer through the RRC.

The RRC has had another very productive year and continues to grow in grants, projects, and new collaborations. This year we added one more director to the RRC, Dr. Richard Vineyard, who is now in charge of science and STEM competitions. We continue to have Dan Ruby as the Director of Informal Education and Outreach, from campus to the neighboring school districts, and Dr. Jacque Ewing-Taylor as the Director of Grants and Evaluation. We have also promoted Sandra Prytherch to manage the daily operations of the RRC.

As for our research, the RRC is associated with just over \$29.3 million dollars of grant-related projects and the RRC is managing \$5.6 million dollars of funding spread across 11 grant projects with about \$250,000 in pending proposals. We collaborated with Extended Studies on the STEM Break Camps offered to grades 6-12 students in Washoe County School District and taught by UNR faculty and staff. The RRC continues to collaborate with the Nevada STEM Coalition on multiple projects and initiatives moving STEM forward in Nevada.

The RRC continues to run the NSF I-TEST grant, Project ReCharge, as well as the USDOE-funded Northern Nevada English Learning Initiative (NNELI) -two of our larger grant-supported projects. Faculty in the RRC continue to work with the NDE on transitioning school districts from the old Nevada State Science Standards to the Next Generation Science Standards. Several of our projects include Lyon, Carson and Douglas counties and collaborations with the Northwest Regional Professional Development Program (NWRPDP). We continue our work in WCSD with multiple projects and trainings. Details of these collaborations and projects are described in this report.

The RRC provides multiple services for faculty and grant-related projects including; educational outreach, professional development, grant evaluation, financial services, and collaborations throughout Nevada. As we look for continued growth and partnerships, the RRC will continue to collaborate on grants and projects with faculty from colleges across the University of Nevada, Reno, the Desert Research Institute (DRI), and TMCC to advance STEM and STEAM education in Nevada.

A Message from the Directors

Jacque Ewing-Taylor, Ph.D.

Director of Grants and Evaluation

This past year was as busy as always for me, managing about \$5 million in external funding and the activities and evaluations of nine grant projects. I participated in writing two successful grants with faculty from Computer Science & Engineering, have a NSF grant in review in collaboration with the Dean of the Graduate School, and am working with various faculty on several grant concepts. I continue to assist faculty in the College of Education and other colleges across our campus with their grant writing activities, funded through the Office of the Vice President for Research and Innovation (5%) and the College of Education's Dean's office (10%). The rest of my position is funded by our current grant projects (85%).



Richard Vineyard, Ph.D.

Director of Science STEM Fairs and Festivals

This year, we are growing the Nevada Science Olympiad Program in northern Nevada and the state. The 2016 Olympiad will be held on Saturday, March 5, 2016, at the University of Nevada, Reno. The headquarters for the competition will be the Davidson Math and Science Building. This year the Science Olympiad is supported by the Colleges of Science, Engineering, Agriculture, Biotechnology & Natural Resources, and the Raggio Research Center for STEM Education. There are 13 high schools and nine middle schools registered for the state competition. Science Olympiad is the most exciting and engaging science/STEM focused academic competition offered for all students. Each team of up to 15 students (B Division, grades 6-9; C Division, grades 9-12) competes in a total of 23 events that cover the full range of science and engineering content. For the first time in northern Nevada, there will be a Science Olympiad event for Division A (grades 3-6) WCSD students in April 2016.



Message from the Directors...continued



Daniel W. Ruby

Director of K-12 Outreach and Informal Science

During 2015, as director of K-12 outreach and informal science education, I oversaw two programs: the AACT Rover program and the Pathway to Space program.

The AACT Rover program, now in its fifth year, is a hands-on STEM training for teachers and secondary students through the WUSD Academy of Arts, Careers, and Technology (AACT), that includes participation in the annual NASA Rover Challenge Competition for human-powered extraterrestrial rover design. Our student team took third overall in this competition among both high school and college teams, and was the fastest team in the continental United States. In 2016, we will expand this program to include students from other signature academies through advanced manufacturing of human-powered vehicles for the NASA challenge as well as other international and regional competitions.

Pathway to Space is a teacher-training program that developed and trained teachers in grade-banded NGSS-aligned curriculum kits for exploring our atmosphere through high-altitude balloons, powered flight, and instrumented rockets in partnership with the Regional Professional Development Program (RPDP). For 2016, we have received funding to add unmanned aircraft systems to the program, and aim to support high school teams in regional and statewide competitions in partnership with the DRI Green Power program.



It was a big finish in 2015 for the AACT Rover program

Professional Staff



Sandra Prytherch

Program Manager, Education Grants

Sandra came to the Raggio Research Center as Project Coordinator of the NNELI grant in 2012. She continues in this role, while expanding to manage other projects, supervise additional staff, and develop proposals. Sandra engages in intercollegiate and cross-institutional outreach, especially in the areas of STEM and English language development. She is the founder of DELTA, an RRC initiative which is focused on the development of a linguistically diverse STEM teacher workforce and was the principal investigator for a project which provided related professional development opportunities for College of Education faculty. Sandra and her husband are avid tandem bicyclists and vegetarian cooks. They are the joyful parents of one daughter and caretakers of a python and a houseful of plants.



Shawn Pennell, NNELI Technology and Paraprofessional Coordinator

Since 2005, Shawn has worked on various grants for the Raggio Research Center including the Pathway Project, NERDS, STNA, Newton Network, and NNELI. Currently, Shawn is working on the NNELI grant and serves as the coordinator for paraprofessionals and technology. She is also involved with the E-Learning for Educators program and the DELTA Initiative. She recently led a team of stakeholders in creating a proposal that was recognized by the White House Initiative for Educational Excellence for Hispanics for a commitment to create a career-ladder program for bilingual paraprofessionals to become certified K-12 teachers. Shawn received her dual degree B.A. in political science and international affairs in 2005. She earned her M. Ed. in Curriculum, Teaching, and Learning in 2009. Her father is hounding her for a Ph.D., graduation TBD. Shawn and her husband David have two wonderful children, the best dog on the planet, and lots of books, art, and music.

Professional Staff



***Rod E. Case, Ph.D., Principle Investigator
Northern Nevada English Learning Initiative,
NNELI***

Rod is an associate professor of TESOL (Teaching English to Speakers of Other Languages) in the College of Education at the University of Nevada, Reno and he is the principle investigator on the NNELI program. His research interests are in various aspects of inter-language pragmatics and second language acquisition. Rod has been at the University of Nevada, Reno since 2001.



***Sue Fitzgerald, Projects Coordinator
EPSCoR grants SCIP and NERDS programs***

Sue joined the Raggio Research Center in the summer of 2015. She is currently working on the EPSCoR Nexus grants SCIP and NERDS programs as well as NNELI. Previously she worked on the Nevada NASA Space Grant program and the NSF GK-12 E-Fellowship. She earned a B.S. in Computer Science from the University of Nevada, Las Vegas. She and her husband Kirk enjoy camping and riding their motorcycles and mountain bikes.

The Front Cover of the RRC Annual Report

A Pyramid Lake beach is shaded under a cloudy northern Nevada sky. Pyramid Lake is a geographic “sink” of the Truckee River; there is no outlet. Water is discharged through evaporation and seepage. Pyramid Lake was the deepest part of ancient Lake Lahontan which covered most of northwestern Nevada at the end of the Ice Age. It was named after pyramid-shaped or cone formations (tufa) visible in the lake and along the shores. (File Photo)

Support Staff



Janice Neal, Accounting Assistant III

Jan began working for the state of Nevada in 1982, serving at Special Children's Clinic, SIIS, Welfare, Community Connections, and USAC at UNR. She joined the Raggio Research Center team in 2004 as fiscal grant manager. After many years of dedicated service, Jan will be leaving the Raggio Research Center January 2016.



Pamela Smith, Administrative Assistant III

Pam joined the Raggio Research Center support staff August 2013. She graduated from San Diego State University in 1978, earning a B.A. in Journalism. She owned and operated a restaurant in Carson City, Nevada for 26 years. Pam enjoys working within the dynamics of the university setting and in the middle of the fountain of youth.



Jeffrey Bouchard, Student Worker

Jeffrey started working as a student worker at the Raggio Research Center in the fall of 2012 for the NNELI grant. He is in his senior year of study, working toward a degree in computer science and engineering. Jeffrey will graduate in May 2016. Jeffrey is also an Eagle Scout in the Boy Scouts of America.



Nick Vienneau, Library Assistant I

Nick Vienneau joined the RRC staff the fall of 2014. He is working to maintain, expand, and market the Resource Center, making sure that teachers have access to science kits for their classrooms.

Graduate Research Assistants



Nathan Youmans

Nathan began working for the Raggio Research Center the fall of 2014 for the NNELI grant. He is currently pursuing his Master's in Education in Secondary Social Studies. Nathan has received a bachelor's degree from the University of Nevada, Las Vegas, and a master's degree from Northern Arizona University, both in Music Composition/Theory. In 2011 Nathan received the Outstanding Graduate Student Award from Northern Arizona School of Music. Nathan and his beautiful wife Rachael, have a dog, 2 cats and a turtle.

We said "Good bye" to Many Graduate Assistants this Year

Sadly, staff of the Raggio Research Center had to say good bye to several of our graduate research assistants as they graduated and moved on to new careers or as grant programs ended and they took on new educational research projects. Brittney Timmons came to work for the Raggio Research Center in 2009 as an undergraduate student. While earning her Master's in Human Development and Family Studies, she led the SCIP program for two years. Marti Deyo, a doctoral candidate, worked on the NNELI program for two years. She is now traveling and collecting data for her dissertation. Monika Bharti joined the Raggio Research Center as a graduate research assistant a week after arriving from her home country of India. She worked with Brittney on both the SCIP and NERDS programs. Monika will student teach during the spring semester, 2016. Finally, Kerry Howard's work on Project HEAT and RIETI, came to a close during the summer of 2015. She is involved in research as she continues her doctoral studies in Geology at UNR.

As this publication was being prepared for printing, the Raggio Research Center proposal to conduct the 2016 State Educational Technology Needs Assessment (SETNA) was approved. Daniel Monk will join the RRC staff as a graduate research assistant for SETNA.

NNELI-Northern Nevada English Learning Initiative

The Northern Nevada English Learning Initiative (NNELI) is a National Professional Development Grant program fully funded by the Office of English Language Acquisition of the United States Department of Education. The grant was sought by the University of Nevada, Reno College of Education, Associate Professor of TESOL Rod Case, Ph.D., principal investigator, along with Jacque Ewing-Taylor, Ph.D., and David Crowther, Ph.D., co-Investigators, in consortium with the Washoe County School District (WCSD). NNELI was funded in May 2012 and is expected to continue for five years, with a total grant award of \$1,935,167. NNELI's purpose is to improve instruction to English Learners (ELs) by providing professional development opportunities for pre-service and classroom teachers as well as paraprofessionals in northern Nevada.

NNELI's purpose is to improve instruction to ELs by providing specific English as a Second Language (ESL) training for undergraduates to procure an ESL endorsement as part of their undergraduate teacher licensure program. NNELI provides both licensed, practicing classroom teachers and pre-service teachers with coursework in Academic Language as well as strategies for working with ELs within science, technology, engineering and mathematics (STEM) content-based disciplines. NNELI offers paraprofessionals specialized training using multi-modal digital ESL/STEM tools which align with the rest of the NNELI program

Our focus is on the NNELI community. We continually strive to create new relationships and collaborations to advance the grant goals. Through social media, workshops, classes, networking opportunities, and our advisory board (with members from WCSD, College of Education (COE) Integrated Elementary Teaching Program, COE Secondary Teaching Program, Nevada Department of Education, and COE Student Advising Center), our aim is to contribute to our participants' community of practice while targeting sustainability and capacity building across participant types and organizations. To learn more about the NNELI program, please visit our website at: <https://www.unr.edu/nneli>



**The Northern Nevada
English Learning Initiative**



University of Nevada, Reno

Project ReCharge

A collaboration between the University of Nevada, Reno, the Washoe County School District (WCSD), and Envirolution, Project ReCharge engages teachers and students to interface with real-time data through innovative energy efficiency technologies and empowers them to make energy-saving recommendations for their schools. Project ReCharge is in its second year.



The project strategy involves implementing research-based energy efficiency curriculum in 8th grade mathematics and science classes, as well as high school environmental science, and Career and Technical Education (CTE) classes. Professional development workshops will support integration of energy and technology into teachers' core curriculum, and create authentic STEM experiences for their students. Project audiences include 30 teachers and 3,000 middle and high school students from mostly rural, economically disadvantaged and racially diverse communities.

Led by a highly-qualified team consisting of the University of Nevada, Reno's Raggio Research Center for STEM Education, Envirolution, a nonprofit energy education provider, and the Washoe County School District, Project ReCharge creates real-world, inquiry-based STEM/ICT learning environments. Hands-on lessons empower students to become energy detectives, discovering how building systems and appliances consume energy in their schools. Project ReCharge's transformative approach goes beyond traditional energy efficiency curriculum by engaging electrical disaggregation technology from Load IQ. Student groups use tablet computers to interact with real-time data; identifying and tracking major electrical loads in their school buildings. Students and teachers then work with Envirolution staff, building control services engineers, and school district facility managers to analyze the data and detail a list of facility and behavioral energy conservation opportunities.

Project ReCharge is designed to have triple bottom-line benefits. Teachers are provided with STEM/ICT resources that result in inspired and career-ready students who, through the course of the program, have identified reductions in school energy expenses and environmental benefits due to energy conservation. The work of these students and teachers has the potential to make a tremendous positive impact on a local, regional, and national level that results in modern, efficient, well-lit, and comfortable school buildings that aren't a drain on school budgets.

EPSCoR Nexus

(EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH)

The EPSCoR Nexus project is funded by the National Science Foundation (NSF). The five-year grant is being conducted through different components across the University of Nevada, Reno (UNR), the University of Nevada, Las Vegas (UNLV), and the Desert Research Institute (DRI).

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. Over the course of the five years, the EPSCoR Nexus project will create a center of research excellence on solar energy conversion to electricity within the context of minimizing its negative impacts on water usage and the environment.

Through EPSCoR Nexus, Nevada will develop innovative approaches to Cyber Infrastructure (CI) and science, technology, engineering, and mathematics (STEM) education, engage stakeholders, and build its workforce while diversifying its economy. Advanced CI capabilities will enable interdisciplinary research as well as education and outreach. Through a life-cycle approach, workforce and education development activities will build and sustain research capacity and Nevada's economic growth by (1) developing trained manpower at graduate, undergraduate, and community college levels that will supply needs of the solar power industry, environmental agencies, and the water industry; (2) developing and expanding a STEM teacher workforce; (3) enhancing education and public understanding of solar, water and energy that will lead to development of a sustainable STEM workforce; (4) establishing a sustainable social network for learning; (5) exposing and involving rural counties, K-12, and underrepresented communities to STEM topics and cutting-edge research; and (6) increasing participation in STEM education through peer-directed content and mentors.

The SCIP program (STEM Career Investigation Program); and NERDS program (Nevada Educators Really Doing Solar), are EPSCoR Nexus programs. These successful programs are highlighted on the following three pages. Visit our website at: <https://www.nvsolarnexus.org>

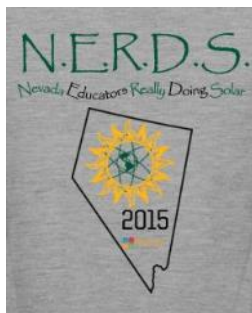


SCIP (STEM Career Investigation Program)

The STEM Career Investigation Program (SCIP) is another program funded by the larger EPSCoR Nexus grant. Open to high school sophomores, juniors and seniors in Nevada, SCIP provides students with opportunities to observe research and career presentations by scientists and engineers in a wide array of STEM disciplines and specializations. The SCIP seminar series is six sessions from February through March. SCIP is in year three of its four years. During the first year, students were introduced to the career of marine biology and research conducted in Antarctica by Dr. Christian Fritsen from the Desert Research Institute. Dr. Richard Kelley from the Computer Science and Engineering department at the University of Nevada, Reno, showed the students the advances in robotics through his research at the university. During year two, Dr. Ravi Subramanian from the UNR Chemical Engineering department, talked to the students about nanostructured materials for solar energy utilization. Two representatives from the University of Nevada, Reno School of Medicine, Dr. Melissa Paisecki and Dr. Jennifer Hagen introduced the many career opportunities in the medical school including psychology and pharmacy careers. Students gathered in groups to explore personality types in the field of psychology and learned how to work together in a group. Dr. Richard Kelly, the UNR roboticist, returned for the second year to talk about drones and their uses in detail. During the last session, students participated in forensic science learning how different blood stain samples from the human body can help in determining one's DNA. Dr. Brittany Baguley, CSI, from the Washoe County Forensic Science department, revealed new investigation techniques that assist in crime investigation cases. SCIP, year three, is scheduled to begin February 2016.



NERDS (Nevada Educators Really Doing Solar)



NERDS (Nevada Educators Really Doing Solar), is a year-long program at the Raggio Research Center, funded by the EPSCoR Nexus grant. The program combines a focus on professional development in science teaching with research in science education. Participants in the program are educators from across the state of Nevada. The teachers are asked to participate in

the research by completing questionnaires and surveys throughout the process. The NERDS program is dedicated to helping teachers develop their teaching skills in the subjects of science, solar, and energy through the process of inquiry.

Every NERDS course is designed to lead teachers, step by step, from "expert"-designed investigations to student-centered investigations through an active process of participation. The field experience portion of the course takes teachers away from familiar ecosystems near their hometown into unfamiliar territory where they must start their learning from scratch, similar to what their students experience every time a new concept is taught. During the summer of 2015, a new group of participants traveled to Tonopah, Nevada to the Crescent Dunes solar facility, and other solar energy installations in northern Nevada. Teachers constructed and raced solar-powered cars. They learned about materials and instruments, applications of solar energy, and solar energy vs other energies. Following the field experience, teachers plan and carry out a lesson plan incorporating all of the science inquiry skills and information they learned in the field, aligned with Next Generation Standards, and teach it to their classrooms.



CLASSP (Cyber Learning Activities to Scaffold STEM Practices)

CLASSP is an EPSCoR Track 3 grant funded by the National Science Foundation (NSF). As a pilot project, CLASSP is a crucial next-step to understanding ways to promote meaningful STEM practices online. The state-wide project addresses the overarching question: how can innovative cyber-enabled instructional methods transform science, technology, engineering and mathematics (STEM) education, and increase opportunities for underrepresented populations? Specifically the project; (1) creates and establishes a cyber learning methodology as a framework to increase STEM interest, participation and success as these students relate to inter-disciplinary content; (2) evaluates the effectiveness of badge and achievement systems from serious gaming literature; (3) identifies best practices to train and effectively support a network of teachers committed to implementing Next Generation Science Standards (NGSS), STEM, and the Common Core state standards using the infrastructure; (4) demonstrate the potential to scale infrastructure for local, state and national disseminations.

Teachers from Reno, Las Vegas and Nevada rural areas traveled to the Raggio Research Center in August 2015 for a professional development workshop. Over the course of the year, the educators will explore the 5-DIE approach for developing scientific literacy for use in their classrooms. The 5-DIE method of instruction aligns with Nevada Next Generation Science Standards. CLASSP will be introduced to students in Nevada through an existing partnership within GEAR UP (Nevada Gaining Early Awareness and Readiness Undergraduate Program).



SETIF (State Educational Technology Implementation Fund)

The Nevada State Commission on Educational Technology awarded 12 grants to Nevada State school districts for FY14 and FY15. The Nevada State Educational Technology Implementation Fund grants (SETIF) totaled approximately \$3.7 million for K-12 education. Eleven of the state's school districts received a grant. One grant was awarded to E-Learning 4 Educators. Grantees submitted proposals that outlined specific goals for improving educational technology in their districts.

The Commission determined that grants should address one or more of the following funding priorities: (1) Common Core State Standards; (2) Smarter Balance Assessment Consortium; (3) Growth model; (4) 1:1 Student Computing; (5) Alternative priority: Innovations in science, technology, engineering and math (STEM) education and Nevada's involvement in the Nevada Stem Education Coalition.

A Summative report was submitted September 2, 2015 to the Nevada Commission on Educational Technology and the Nevada Department of Education by Dr. Jacque Ewing-Taylor and Dr. Bill Thornton, Raggio Research Center, University of Nevada, Reno and Dr. P.G. Schrader, University of Nevada, Las Vegas.

The report lists the improvements made within school districts to advance educational technology. Washoe County School District (WCSD) provided extensive professional development for teachers related to implementation of technology into the classrooms including, establishment of its 21st Century Learning Academy. Carson City School District purchased 600 Think Pads; one for every sixth-grade student. In Mineral County, improved internet access from the expansion of bandwidth resulted in significant positive impacts on teaching and learning. Elko County School District purchased 900 Chromebooks. Elko County teachers received professional development related to the development of lessons using Chromebooks and the Canvas course-management systems.

More educational technology funding has been approved for the 2015 and 2016 school year by the Nevada State Legislature and will focus on Nevada Ready 21, the 1:1 initiative.



Project HEAT



Project HEAT (Hot Environments And Temperatures) provides an educational workshop for Dean's Future Scholar students entering grades 7 and 8. Project HEAT is funded by the National Aeronautic and Space Administration (NASA)

as part of a scientific research project titled, *"Desert birds in a warming world: Characterizing thermal stress daily Earth observation data in a complex terrain,"* awarded to Dr. Tom Albright (Geography) and Dr. Jacque Ewing-Taylor (RRC). The educational objective of this program is to increase interest in STEM topics among disadvantaged college-bound youth by engaging them in learner-led, inquiry-based activities integrating micrometeorology, ornithology, and NASA imagery.

Dean's Future Scholars (DFS) students participated in the third Project HEAT workshop from June 15-19, 2015 at the Raggio Research Center. During the workshop, students interacted with UNR faculty and graduate students, and learned about remote sensing, desert bird adaptations to high temperatures, thermal imaging, and desert environments. Students also learned about methods in micrometeorology, including how to use specialized sensors to take measurements of air temperature.

Students worked with faculty and graduate student researchers to carry out a short research project using the air temperature sensors. First, students decided on a research question that they could answer by collecting air temperature data over a 24-hr period at Rancho San Rafael Park in Reno, NV. Students then created a study design and deployed their temperature sensor (s). After 24 hours, the students retrieved their sensor (s), downloaded the data, analyzed the data, and presented the results with respect to their original research questions.



DELTA Initiative

DELTA (Developing English Language Teaching Ability) is a STEM-ESL teacher preparation project based in the Raggio Research Center for STEM Education in the College of Education at the University of Nevada, Reno. DELTA's ultimate, long-term aspiration is the research, design and implementation of a multichannel pipeline to bring linguistically diverse students into the STEM workforce. DELTA submitted two proposals in 2015-- a foundation opportunity to develop a research-practice partnership to study STEM and language variables in two-way immersion schools and a second, successful proposal, recognized by the White House Initiative on Educational Excellence for Hispanics to create a career-ladder to enable bilingual paraprofessionals to become teachers.

SETNA (State Educational Technology Needs Assessment)

Raggio Research Center was awarded the SETNA grant by the Nevada Department of Education in December 2015. Other studies have occurred during 2010, 2012, and 2014, in support of the needs assessment requirements set forth in NRS 388.795. For 2016 SETNA, three essential analyses are required to be part of the project:: (1)The need for computer-based assessments at all grade levels and to measure high school proficiency. (2) The integrations of educational technology to improve student achievement and proficiency. (3) The feasibility and costs associated with using laptop computers instead of traditional textbooks. During the 4-month state and district-wide assessment, the following research questions will be asked: (1) What is the current status of the state and district educational technology plans? (2) In what ways can educational technologies improve instructional development, delivery, and assessment in Nevada; (3) What is the current capacity of schools in Nevada to positively impact the achievement of students through the use of educational technologies? (4) How prepared are Nevada teachers to integrate technology into the classroom? Data will be collected through teacher surveys, district-level technology coordinators, parent surveys and data other generated during the 2012 assessment.

Additional Services Offered by the *Raggio Research Center for STEM Education*

The Raggio Research Center

also provides the following services:

- ⇒ **Grant Management Services**
- ⇒ **Evaluation Services**
- ⇒ **Partnership to satisfy the K 12 education/outreach activities required by many grants**
- ⇒ **Facility rental & event space for up to 150 persons**
- ⇒ **Professional Development**
- ⇒ **Resource Center for grant participants, partners and educators**

To learn more about how the Raggio Research Center can support your proposed research and/or outreach projects, please visit our website. For further information on how to join our list of donors and become a supporter of the Raggio Research Center programs, please contact: David T. Crowther, Executive Director: crowther@unr.edu



Raggio Research Center

Mail Stop 432

Reno, NV 89557

Phone: 775-784-8288

Fax: 775-327-2016

<http://www.unr.edu/raggio-center>