Sierra Nevada Research Institute
5 year Self-Assessment
AY 2010-11 through 2014-2015

UNIVERSITY OF CALIFORNIA

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Sierra Nevada Research Institute
UNIVERSITY OF CALIFORNIA, MERCED

March 24, 2016

Dr. Samuel Traina
Vice Chancellor for Research and Economic Development
University of California, Merced

Dear Dr Traina:

In 1997 the UC Merced Research Advisory Committee developed research partnerships with Yosemite and Sequoia-Kings National Parks. In 1999 a prospectus was published outlining the creation of the Sierra Nevada Research Institute. Since 2002, when the founding director of the SNRI joined UC Merced, founding and later faculty have grown the Sierra Nevada Research Institute into an exemplary expression of the value and impact that this world-class research institution has for this region of California, the Sierra Nevada and Central Valley. The breadth and reach of SNRI's research partnerships and community engagement throughout the Sierra and the San Joaquin Valley is a testament to the vision of the founders of UC Merced, and the creators of SNRI. Faculty and researchers work with State, Federal and local agencies as well as private landowners to concentrate the power of the UC on the critical questions facing the region.

This 5-year review reflects the leadership power of the UC research community and the importance of the geographic location of UC Merced in the heart of the San Joaquin Valley. Focused on the mission of the SNRI, the faculty members of SNRI continue to pursue new questions and discover new knowledge in a robust and interdisciplinary environment. The SNRI is proactively strengthening the institution of UC Merced by incubating new programs such as the Environmental Analytical Laboratory, the Spatial Analysis and Research Center, the UC Merced Natural Reserve Program, and the Center for Climate Communications; hosting the first National Parks Institute programs; and most recently, creating the UC Water Security and Sustainability Initiative.

The last 5 years have been an exciting time for UC Merced and SNRI. The SNRI is demonstrating itself as a central hub for researchers, students and faculty focused around questions of sustainability, resource management, climate, creating new knowledge and new information. The results of these efforts are improving the quality of life and the quality of the environment by providing better decision-making information for business, for citizens and for government leaders of the region.

Very truly yours,

Roger C. Bales
Distinguished Professor of Engineering
Director, Sierra Nevada Research Institute

SNRI ORU 5 Year Self-Assessment

FY 2010 – FY2015

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Sierra Nevada Research Insititute
5 year Self Assessment FY2010 -2015

1. GOALS AND OBJECTIVES

The mission of the Sierra Nevada Research continues to be "to discover and disseminate new knowledge that contributes to sustaining natural resources and promoting social well being in the Central Valley and Sierra Nevada regions of California, and related regions worldwide, through integrated research in natural science, social science, and engineering." This mission is being accomplished through:

- Collaborative, multidisciplinary research conducted by faculty, students, staff in the School of Natural Science, the School of Engineering, and the School of Social Science, Humanities and Arts at UCM;
- Strong interactions with related research units within the UC system (e.g. CITRIS, UC Solar) and close collaborative relations with scientists and managers at national laboratories (particularly LLNL) and local, state, and federal agencies;
- Creation of research facilities on the UCM campus and within the Central Valley and Sierra Nevada regions of California,
- Extensive sharing of SNRI data and information with public and private stakeholders,
- Sharing research results with local and regional stakeholders through public forums and workshops
- Strengthening SNRI faculty engagement for Campus Strategic Academic Focus areas – especially Sustainability, Management and Human Health Science

2. EVIDENCE OF ACCOMPLISHMENTS

2.1. Research.

Between 2010 and 2015 the faculty, researchers and leadership of SNRI have contributed significant research and scientific leadership in this region of California, across the state, and in comparable regions worldwide. The SNRI has attracted researchers from around the globe as well as graduate and undergraduate students from throughout California, the nation and the world. Important new programs have been incubated and have been grown out of the focus areas of SNRI.

The quality and significance of completed and ongoing research are evidenced by the continuing publication of papers in high-profile journals, papers in top disciplinary journals, and press reports highlighting SNRI research. SNRI faculty have also been very productive in securing grants and contract to support research. The quality, quantity and significance of completed and ongoing research by SNRI Faculty is well represented by the over 1,000 published papers by SNRI faculty and researchers. We provide examples of SNRI faculty areas of focus and examples of significant faculty research in this section. We provide here a bibliography of published work of the last 5 years by the faculty and researchers of SNRI:

See attachment A: (pages 22 - 104)

SNRI researchers are at the forefront of significant trends within their disciplines, including climate, hydrology, biogeochemistry, ecology, soils, sustainability, water resources, and other disciplines within social science, natural science and engineering. SNRI is developing the knowledge needed to create paths toward sustainability for this and future generations, in the California region and beyond.

- Many of these papers published by the faculty and researchers affiliated with SNRI have been cited numerous times and resulting articles have seen wide coverage in the media on topics including: climate-change adaptation, wildfire-climate relationships, newly developed water and snow information for Sierra watersheds, leading solar research and innovation, and more.
- SNRI faculty and researchers are recognized as thought leaders and are regularly engaged with elected officials and agencies, industry leaders, the media, science and academic institutions in their respective areas of expertise and investigations, including ecosystem science, energy, drought, food production, water resources, forests, fire, air quality, and climate change.

One hallmark of SNRI is its contributions to building research capacity at UC Merced, adding value and capabilities that would have been much more challenging to achieve within other campus structures. SNRI has served as a cross-campus champion for multiple centers and programs of interest to SNRI faculty, the campus and broader region.

- SNRI built up and administered the Environmental Analytical Laboratory (EAL), with the SNRI Director also serving as EAL Director. The EAL is now a central research facility with a faculty director, reporting to the Vice Chancellor for Research. SNRI staff continue to provide business support for the EAL.
- SNRI also worked with faculty, School Deans and others to plan and initiate the Spatial Analysis & Research Center (SpARC), now also a cross-campus facility with a faculty director.
- Until 2014, the SNRI Director also served as faculty director for UC Merced's Yosemite Field Station, Sequoia Field Station and the Grassland-Vernal Pools Reserve adjacent to campus. In 2006 the UC Regents approved incorporating the field stations into UCs Natural Reserve System (NRS) as the Sierra Nevada Research Station. In 2013 the regents approved incorporating the campus reserve into the UC Natural Reserve System. SNRI led these efforts for the campus, and in 2014 handed over responsibility for these NRS sites to a UC Merced NRS faculty director, who reports to the Vice Chancellor for Research. However, SNRI staff continue to provide business and other support for the NRS.
- In 2014 the newly established UC Water Security and Sustainability Research Initiative (UC Water), proposed by the Director and other faculty within SNRI was funded by the UCOP after winning a UC system-wide competition of over 186 proposals. UC Water brings together experts from across the UC system and is working to build a strategic base of water knowledge to help the state achieve a water secure future.
- The UC Advanced Solar Technologies Institute (UC Solar) was also renewed in 2015, in the same competition as UC Water. Initiated in a 2011 UC system-wide competition, UC Solar is designing and developing innovative solar-energy generation technologies that are more efficient, more affordable, and easier to integrate.
- In 2013, SNRI initiated the Center for Climate Communications at UC Merced.

The continuing productivity and influence of SNRI faculty and researchers, locally as well as nationally and internationally, are evidenced by their publication record, by press reports and their leadership within their fields. These aspects, plus evidence of their prominence in the fields represented within SNRI are apparent in the following profiles of 39 faculty who were affiliated with SNRI during the 5-year period ending in June 2015.

1. Andreas Aguilar – Assistant Professor, School of Natural Sciences (2006-2012). Working in marine and freshwater habitats, Professor Andreas focuses on conservation genetics, population genetics and genomics. He has published work on the fairy shrimp of the Merced Vernal Pools, steelhead trout and marine species. All of his work reflects collaboration with other UC Merced labs as well as researchers from other universities and institutions.
2. David Ardell – Assistant Professor, School of Natural Sciences (2010-present). In 2013, the Ardell Lab won an NSF INSPIRE award for an interdisciplinary collaborative project on *Selection as an Organizing Principle: from Molecules to Languages* together with the labs of Rick Dale (Cognitive Science), Suzanne Sindi (Applied Math), PI Gary Lupyan (U. Wisconsin, Psychology) and Russel Gray (University of Auckland, Psychology). This project brings together many kinds of expertise to look at the evolution of languages, genetic and biological codes, and prions in mixed populations. (*davidardell.org/news*)
3. Roger Bales – Professor, School of Engineering, Director SNRI, Director UC Water (2003-present). The Southern Sierra Critical Zone Observatory, UC Water and the Sierra Nevada Research Institute are all hallmarks of Dr. Bales' work at UC Merced and SNRI. Dr. Roger Bales is Distinguished Professor of Engineering and a founding faculty member at UC Merced, and has been active in water-

and climate-related research for over 30 years. His scholarship during this review period includes 24 articles in peer-reviewed journals, and more presentations, book chapters, reports, news articles and published opinion pieces. His work is focused on California's efforts to build the knowledge base and implement policies that adapt our water supplies, critical ecosystems and economy to the impacts of climate warming. He works with leaders in state agencies, elected officials, federal land managers, water leaders, non-governmental organizations, and other key decision makers on developing climate solutions for California.

4. Michael Beman – Assistant Professor, School of Natural Sciences (2009-present). During this review period his work includes 14 published articles in peer-reviewed journals. His lab group is focused on climate change, ocean acidification, ocean deoxygenation, and atmospheric nitrogen deposition. From the biodiversity of the lakes in the Sierra Nevada of California to the bio diversity of marine lakes in Palau and work in the Gulf of Mexico he has collaborated with researchers from several other universities. He was also co-PI for the Yosemite REU program. (*bemanlab.org/about/research*)
5. Asmeret Asefaw Berhe – Associate Professor, School of Natural Sciences (2009-present). A soil biogeochemist, Dr. Berhe works from the high elevation meadows of the Sierra to the floor of the San Joaquin Valley. From the effects of fire on soil characteristics to the role of erosion on terrestrial carbon sequestration and various investigations with regard to soil organic matter, her work is critical to understanding potential impacts of climate variability on forest health, agriculture and all terrestrial ecosystems.
6. Jessica Blois – Assistant Professor, School of Natural Sciences (2013-present). LaBrea Tar Pits, the Merced Vernal Pools & Grassland Reserve, Yosemite National Park, the landscapes of Northern California – all are the settings for the research lead by Dr. Blois. She investigates the impacts of climate change on mammals by comparing fossil populations to modern day populations and is creating better understanding of the connections between individual, population, species and community level responses to climate.
7. Marc Buetel - Associate Professor, School of Engineering (2015-present) His research focuses on the sustainable management of dilute pollutants in the aquatic environment. Research topics include strategies to repress mercury bioaccumulation in California reservoirs, including super-oxygenation using pure oxygen gas, and the use of natural treatment systems, include surface-flow vegetated wetlands and rock biofilters, to enhance surface water quality. Dr. Beutel won a NSF CAREER focusing on oxygenation and mercury cycling in lakes with a water-science outreach component to high school student on the Colville Indian Reservation. He is an active member of the American Ecological Engineering Society.
8. Elliott Campbell – Associate Professor, School of Engineering (2010-present). Dr. Campbells' research group primarily focuses on atmospheric sciences and engineering. Currently operating with grants from NASA, NSF and DOE, his work includes Environmental Sustainability, Carbon cycle science, terrestrial ecosystem science and climate change research. A recently co-authored article by Dr. Campbell received extensive coverage: Geophysical Constraints of Food *Zumkehr, A., and Campbell, J. E.: The potential for local croplands to meet US food demand, Frontiers in Ecology and the Environment, 13, 244-248, 10.1890/140246, 2015.*
9. YangQuan Chen – Associate Professor, School of Engineering (2012-present). The MESA Lab was established by Dr. Yang Quan Chen in 2012. This multi-disciplinary group researches a broad range of topics including: Unmanned Aerial Systems and UAV-based Personal Remote Sensing, Cyber-Physical Systems, Modeling and Control of Renewable Energy Systems, Mechatronics and Applied Fractional Calculus. The work being done by Dr. Chen in collaboration with his colleagues and students has resulted in an impressive list of published papers and significant discoveries. He continually seeks to develop cutting edge technology and is engaged with aerospace technology, beneficial technology for the disabled, lighting and energy controls, improving mechatronics and modeling new systems for improved agricultural applications.
10. Yihsu Chen – Associate Professor, School of Engineering (2010-2015). In particular, his work on emission trading policies has received considerable attention and has also directly contributed to

policy debates. For example, his early work with Energy Research Centre of the Netherlands (ECN) on the European ETS (Emission Trading Scheme) windfall profits led to the European Commission auctioning off emission allowances in the second phase of the ETS. The work has received more than 400 Google citations. His work on the equivalence of emission trading programs with different point-of-regulation also partly helped California Air Resources Board finalize their decisions in implementing first-sellers approach to control greenhouse gas emissions associated with imported power.

11. Martha Conklin – Professor, School of Engineering, Director of UC Merced Natural Reserve System (2003-present). For most of her career, Dr. Conklin, has focused on groundwater-surface water interactions, determining timescales of reactions that occur at this interface as well as groundwater contributions to stream flow using natural tracers. She led projects to understand water and nutrient budgets in montane meadows and the education and outreach efforts. Dr. Conklin continues to be a leader in the Southern Sierra Critical Zone Observatory, Sierra Nevada Adaptive Management Project, UC Water, Earth Science Literacy Initiative and USFS Meadows project.
12. Michael Dawson – Associate Professor, School of Natural Sciences (2006-present). Focused on the origins, maintenance, and loss of biodiversity, from molecular to ecosystem levels in marine ecosystems, islands and invertebrates. This work informs current global issues around topics such as invasive species and climate change.
13. Benoit Dayrat – Assistant Professor, School of Natural Sciences (2009-2014). Dr. Dayrat led the Research Experience for Undergraduates at Yosemite where he designed research projects regarding gall wasp specialization in the Central Sierra Nevada region, and the environmental DNA barcoding of Yosemite freshwater macro-invertebrates. At UC Merced he focused on the biodiversity and evolution of mollusks and gastropods. In 2014 he moved to a faculty position at Penn State University.
14. Gerardo Diaz – Associate Professor, School of Engineering (2005-present). Renewable energy conversion, dynamic simulation and control of thermal systems, biomass gasification, thermal and non-thermal plasma applications to energy generation and water conservation, optimization of thermal systems, solar thermal systems. Utilizing the Sustainable Plasma Gasification Laboratory at the University of California, Merced Professor Diaz tested six different types of biomass and published the work in *Int. Journal of Hydrogen Energy,* Vol. 40, pp. 2091-2098, 2015.
15. Danielle Edwards – Assistant Professor, School of Natural Sciences (2015-present). One of the newest members of the SNRI Faculty, she leads "integrative studies to inform conservation management strategies for endangered and vulnerable reptiles and amphibians. Her research focuses on arid regions of the world. These environments are some of the most recently derived and extreme environments on the planet, they are also expanding with human-induced climate change." The Merced Vernal Pools and Grassland Reserve are a prime location for her research and teaching.
16. Marilyn Fogel – Professor, School of Natural Sciences, Director of the Environmental Analytical Laboratory (2013-present). Professor Fogel is internationally recognized as a pioneer and leading scientist in the use of stable isotopes for understanding fundamental processes in ecology, ecosystem science, paleoecology and paleoclimatology, astrobiology, biogeochemistry, and marine science. The Fogel Lab collaborates with researchers from around the globe.
17. Henry Forman – Professor, School of Natural Sciences (2003-2015). A founding faculty member of SNRI, Dr. Foreman is now a Professor Emeritus. Dr. Forman's laboratory focused on the molecular biology and biochemistry of signal transduction and cellular adaptation to reactive oxygen species and other electrophiles relevant to the response of the lung to environmental pollution.
18. Carolin Frank – Assistant Professor, School of Natural Sciences (2011-present). Dr. Frank studies the potential benefit of bacterial communities for conifers in highly variable climate/soil/moisture conditions in the Sierra and the Rocky Mountains. This work is done in partnership with other SNRI researchers as well as partners from other universities. In 2014 Dr. Frank along with collaborators was awarded a $1.6 million for a 4 year "Dimensions of Biodiversity Award." Dr. Frank said," UC Merced is a great place to do interdisciplinary team science."

19. Teamrat A. Ghezzehei – Associate Professor, School of Natural Sciences (2009-present). The movement and transformation of mass and energy in soil and their applications to environmental and energy-related problems along with sustainable food production, bio-geochemical cycles, arid-zone ecosystems and soil biophysics are all areas of study of the the Ghezzehei Lab Group. This group is one of the participants in the UCOP Research Catalyst Awards for their project," "California Drought and Carbon Management for Agriculture".
20. Qinghua Guo – Associate Professor, School of Engineering (2005-present). In 2014 Dr. Guo received the Erdas Award for Best Scientific Paper in Remote Sensing: American Society for Photogrammetry & Remote Sensing. He is a recognized leader in his work in Geographic Information Science, Remote Sensing of Environment, Lidar, Geographical One-class Data, Climate Change and Terrestrial Ecosystems.
21. Thomas Harmon – Professor, School of Engineering (2003-present). Dr. Harmon developed the Sierra Nevada San Joaquin Valley Hydrologic Observatory (SNSJHO) – a digital library that houses the data for the NSF Critical Zone Observatories, the Water Sustainability and Climate program and other projects of the University. The Harmon Research Lab was awarded the US NSF Water Sustainability & Climate Program (Award CBET-1204841, $1.5M, 2012-2016).
22. Stephen Hart – Professor, School of Natural Sciences (2008-present). Dr. Hart's research explores the controls of biogeochemical processes and productivity in managed and wildland terrestrial ecosystems. His work focuses on ecological genetics, isotopic analyses and computer simulation modeling. Along with publishing 39 peer reviewed articles in the last 5 tears, he has been the PI with the NSF funded, Research Experience for Undergraduates at UC Merced, which has been coordinated out of the Yosemite Field Station in the summer.
23. Kathleen Hull – Associate Professor, Anthropology, School of Social Sciences, Humanities and the Arts (2006-present). Published 7 peer-reviewed articles, contributed book chapters, developed research reports and presented at several professional meetings and conferences from Hawaii to Yosemite and Arizona. Dr. Hull has also worked under contract and through cooperative agreement with Yosemite National Park and the Presidio Trust during this time. Professor Hull has been a member of the SNRI Advisory Council from 2010-present.
24. Robert Innes – Professor, School of Social Sciences, Humanities and the Arts (2009-present). The County Bank Chair of Public Policy at UC Merced 2014-present. Tony Coelho Chair of Public Policy, UCM 2009-14. Several areas of his work directly intersect with the goals of SNRI including better understanding of the economics of soil depletion, safe drinking water, voluntary pollution reduction and innovation in environmental technologies. He has 8 peer-reviewed publications from the current 5-year period and several working papers on topics related environment and politics in process.
25. Andrea Joyce – Assistant Professor, School of Social Sciences, Humanities and the Arts (2011-present). A 2011-12 Fulbright Scholar, her current research includes integrated pest management and biological control of insects in food systems, and investigating the relationship between habitat variation, climatic variability, and genetic variation in several mosquito species.
26. Lara Kueppers – Assistant Professor, School of Natural Sciences (2006-2013). Ecological consequences of climate change, alpine treeline warming, climate-ecosystem feedbacks and agriculture and climate change. From the crest of the Sierra Nevada and high mountains to the agricultural lands of the San Joaquin Valley, Dr. Kueppers has published 15 peer-reviewed articles during the period of this self assessment.
27. Valerie Leppert – Associate Professor, School of Engineering (2003-present). A founding faculty member and founding faculty for SNRI. She was Chair, Biological Engineering and Small-scale Technologies Graduate Emphasis Program, UC Merced 2010-2013. Along with her research she has been active in mentorship programs for grad (3) and undergrad students (31) during time of this assessement.
28. Teenie Matlock – Associate Professor, School of Social Sciences, Humanities & Arts (2009-present). The McClatchy Chair of Communications and Associate Professor of Cognitive Science at UC

Merced. She is the founding director for the Center for Climate Communication – a program of the SNRI. Dr. Matlock provides a critical link in the work of SNRI researchers in understanding effective communications strategies around climate. She has developed an annual climate communication conference which is hosted on campus at UC Merced. Her research on cognitive linguistics continues to attract significant external support ($1million over the last 5 years)

29. Emily Moran – Assistant Professor, School of Natural Sciences (2014-present). Moran Plant Lab is focused on climate driven shifts of plant populations, their ecology and their evolution. Her work is focused on the Sierra Nevada and the San Joaquin Valley region. She is one of the leaders in getting the first research greenhouse built on campus.
30. Peggy O'Day – Professor, School of Natural Sciences, Chair of Environmental Systems Graduate Group (2003-present). A founding faculty member for the university and for SNRI. An environmental geochemist, her lab explores geochemical questions affecting human health, influences/treatments for mercury contamination and remediation of soils and sediments. Has published articles in 15 peer-reviewed journals.
31. Robert Rice – Lecturer, School of Engineering (2006-present). Dr. Rice began his work with SNRI in 2003 as a PostDoc. Along with published papers in peer-reviewed journals, he has presented at the AGU for a number of years on sensor networks in Sierra Nevada watersheds as well as work on estimating snow/water equivalent methods. During this review period he has worked on projects funded by NSF, CDW and NPS.
32. Erik Rolland – Professor, School of Engineering (2012-present). Dr. Roland has published 9 articles in peer-reviewd journals in this time period and has worked with SNRI faculty and staff on the National Parks Institute work. This effort has now moved to the emerging School of Management and Dr. Roland's work continues in this area.
33. Wolfgang Rogge – Associate Professor, School of Engineering (2008-present). Investigates air pollution, pollution and climate change. His expertise is vital in the San Joaquin Valley where over 150 air quality violations occur on average per year.
34. Jason Sexton – Assistant Professor, School of Natural Sciences (2014-present). Invasive species, plant evolution, plant genetics and applying sociocultural adaptation to conservation hotspots are some of the topics investigated in the Sexton Lab. He is building collaborative research with other UCM and SNRI researchers and professors to understand how ecosystems can be better understood utilizing evolutionary theory as global change redefines sustainability in these systems. He is a leader in getting the first research and teaching Greenhouse built on the UCM Campus.
35. Samuel Traina – Professor, School of Natural Sciences and Professor, School of Engineering, Vice Chancellor for Research and Economic Development, Founding Director of SNRI (2002-present).In the last 5 years, VC Traina has contributed to 4 published papers – each on a different area of focus for the SNRI – air quality, mercury contamination, air pollution impacts on humans and the environment and the role of black carbon in the environment.
36. Joshua Viers – Professor, School of Engineering, Director CITRIS (2013 –present). Since joining SNRI, Dr. Viers has published 14 articles in peer-reviewed journals. The work covers studies on dams, simulations of hydropower in warming climates, water contamination, perspectives on water rights, aquatic species information systems – all of these topics relevant to the SNRI mission. Dr. Viers along with Dr. Bales led the submission of the UC Water Security and Sustainability Initiative which was funded by the UCOP in 2014.
37. Leroy Westerling – Associate Professor, School of Engineering (2010-present). With 6 peer reviewed articles published in journals during this period, Dr. Westerling continues his critical work in understanding how climate change and forest management is affecting fire frequency and intensity as well as anticipated impacts and actual outcomes of forest fires. His work has been cited numerous times in the print media as well as in audio and video interviews.
38. Roland Winston – Professor, School of Engineering, Director UC SOLAR (2003-present). Dr. Roland Winston is a Distinguished Professor and founding faculty member in the schools of Natural Science and Engineering at UC Merced. and a founding member of SNRI. He is also Director of the

University of California Advanced Solar Technologies Institute (UC Solar) Dr. Winston's research and teaching focuses on concentrating solar energy systems and applied nonimaging optics. The concepts developed and the devices invented by Dr. Winston have formed the core of a new technology which carries the promise of making solar energy a truly viable energy source for society. Devices to which Winston's name has become attached include the CPC itself, which is sometimes known as a "Winston solar collector" and "Winston cones," the individual parabolic elements that make up a CPC. NRI investigators collaborate with Dr. Winston on projects on water, food production and applications as they address air, water and soil research in the SJV and the Sierra Nevada.Practical applications can be found in photovoltaics, natural lighting of buildings, water heating, space heating and cooling, desalinization, cooking and in the collection of solar UV radiation for the photo-catalytic treatment of contaminated wastewater. Nonimaging optics proved to be an important tool in several other areas including astrophysics, elementary particle physics, infrared physics and vision research.

39. Jeff Wright – Professor, School of Engineering, Dean of Engineering (2003-2011). After serving as the Director of CITRIS and member of SNRI, in 2011 Dr. Wright moved to Western Washington University where he is now Dean of the College of Sciences and Technology.

SNRI was established to foster collaborative interdisciplinary research at UC Merced, and through its efforts has helped to create a culture of cross-disciplinary collaboration across the campus. SNRI has also built bridges with collaborators from other UC campuses, DOE labs, other federal research groups and elsewhere. SNRI faculty have led or participated in many large interdisciplinary research projects, such as the Southern Sierra Critical Zone Observatory (CZO), the Sierra Nevada Adaptive Management Project (SNAMP) and others noted above under faculty profiles.

The SNRI office has a well-developed ability to provide administrative support for these projects, which generally involve several investigators from multiple units on campus or outside organizations. This includes support for the most recent multi-campus effort created by SNRI leadership: The UC Water Security and Sustainability Research Initiative. This program includes 27 faculty/collaborators and 14 students/staff. This group spans several programs and departments and includes projects throughout the Sierra and the Central Valley of California. With meetings around the state and an active Directors Council, UC Water exemplifies that collaborative power of SNRI Faculty and leadership.

As researchers pursue expanded questions around the nexus of energy/water/food and health, the SNRI provides a perfect structure in which the collaborations are nurtured academically and supported administratively.

Postdoctoral scholars are an important part of SNRI's research implementation. The SNRI faculty labs recruit postdoctoral scholars for research positions and these scholars re key contributors to the authorship of published work. In some instances, the postdoctoral scholars working in SNRI did their undergraduate and graduate work at UC Merced. Postdoctoral studies at SNRI have recently included investigations around surface-water storage relative to climate change, environmental water management within traditional water management practices, tree-line warming studies, ecological modeling, paleoecology, biogeography, organic chemistry and soil chemistry. The geographic locations of the work done by these postdoctoral scholars extends from the ocean lakes of Palau to the crest of the Sierra Nevada and the laboratories of UC Merced.

SNRI has been the academic home for several research faculty in the past five years. Most recently:

- Dr. Mohammed Safeeq is a Research Scientist who works with on watershed science issues in the Sierra Nevada, in collaboration with Pacific Southwest Research Station of the U.S. forest Service and the Southern Sierra CZO. He is also an Assistant Adjunct Professor of Engineering at UCM.
- Dr. Tapan Pathak, a Cooperative Extension Specialist, is studying the role of climate information and the effect on agricultural practices in the state.

- Award winning scientist, Emmanuel Vincent, a project scientist at UCM, has developed a new approach to providing academically critiqued and publicly available "credibility" ratings on media stories about climate change. His project is called "Climate Feedback" and is drawing attention to the Center for Climate Communications at UC Merced.

In the past five years, visiting scientists and scholars from around the globe have led or participated in research, professional development and presentations on climate communications, arctic studies, carbon cycling, ecosystem feedbacks to climate change, drought, fire, complex water resources problems, watershed sensor networks, hybridization of native trout species, soil science investigations, air quality studies and more.

The attached SNRI annual reports for 2010 through 2015 contain specific examples of additional work and projects of visiting scholars and scientists.

***See attachment B: SNRI Annual Reports (2010-2015) from page 105through page* 214**

Research within SNRI is supported by extramural funds from a range of federal, state and private sources. In the last 5 years, SNRI Researchers have successfully attracted over $28 million in grants and gifts. These grants have ranged from multi-year NSF grants to competitive awards from the UC Office of the President. A list of awards for this period, for which data were available, is attached, and a summary in the following table. For the recent 5-year period, SNRI faculty were responsible for about 37% of UC Merced's extramural research grants. This is slightly lower than for the previous 4-year period (44%), reflecting growth of other areas within the university, when the SNRI annual average was about $5.8 million versus the current $5.6 million average. Note, however, that the prior 4 years represents total awards, versus the current 5 years represents annual appropriations, owing to a change in data availability from Sponsored Projects.

	Amount per FY, million dollars						
Item	10-11	11-12	12-13	13-14	14-15	Sum	Average
UCM Extramural grants (appropriations)[a]	16.8	17.2	20.0	18.6	21.7	94.4	18.9
UCM Research grants[b]	12.8	12.0	15.5	15.8	19.7	75.7	15.1
UCM Research grants to SNRI faculty	4.3	3.9	7.5	5.5	6.8	28.0	5.6
Percent of research grants to SNRI faculty	33.9	32.9	48.7	34.4	34.3	37.0	37.0

[a]Based on best available data from Sponsored Projects Office

[b]Extramural grants minus grants for undergraduate education, community outreach, etc.

See attachment C: SNRI Award list pages 215-219

Awards came from NSF, US Forest Service, UC ANR, Bella Vista Foundation, UCOP, The Yosemite Conservancy, USDA Prime, US Dept of Energy, UCSC (MRPI prime), MID(DWR prime), Lawrence Livermore Lab, California Trout, USDI, NPS, South Yuba River Citizens League, Ca Pistachio Research Board, Mosquito Research Foundation, USC (NIH prime), Vollmar Natural Land Consulting, (UCSD (NSF prime), UCSD (NOAA prime), Penn State, CITRIS, DWR, Almond Board of California, UCB (NSF prime), USC (NIH prime), Resources Legacy Fund, UC Berkeley (USDA prime)

During the same 5 year period, SNRI has been supported with $3,192,994.00 from State General Funds to pay for staff, supplies, administrative support, training and vehicles.

See Attachment for a listing of SNRI Administration expenses FY 2010-FY 2015 page 272- 284

SNRIs administrative staff, and SNRI faculty and staff participate in the delivery and participation in professional development both on campus and at offsite opportunities. The SNRI administrative staff participates in sponsored training classes presented by HR and Campus leadership. There are research administration forums, some trainings on administrative processes and an annual UC wide Academic

Business Conference. There is a need for more administrative training/support opportunities on campus. This is critical as the UCM campus continues to grow at a rapid rate and this is already putting extra demands on the existing administrative staffs of UCM, including the SNRI administrative team.

There are trainings provided for field research assistants and students including lab fundamentals and safety and field safety classes such as heights training, and snow mobile training. Some classes that need to be offered in this area include: first aid training, defensive driving, 4-wheel vehicle operation and tool safety.

SNRI faculty and researchers participate in professional development opportunities in a variety of settings. A review of all SNRI faculty members CV's reveals an impressive and international landscape of research forum participation and presentations. At professional conferences like the AGU and EGU, SNRI faculty presentations include papers, posters and audio-visual lectures. Many SNRI faculty have given keynote addresses at major professional conferences and symposia. SNRI faculty and researchers continue to be invited to give guest lecturers at Universities throughout the US and in other countries.

On campus and in the local community, SNRI faculty offer regular symposia for students, faculty, staff and the public. Distributed through the "Happenings" on the campus list-serve and posted on bulletin boards around campus and the community, these presentations are offered every week while classes are in session at UC Merced. These symposia include presentations hosted by faculty which brings academics and professionals from other campuses and communities to present to the UC Merced academic community. In many cases it is UC Merced faculty, researchers and scientists who bring their current investigations into forums to share with the campus community.

Some graduate students are also supported by UC funds for teaching and research assistants; and additional support comes from UCs office of the President, e.g. UC Solar and UC Water.

2.2. Graduate and Undergraduate Research Training

Much of the research done on grants by SNRI faculty is done by graduate and undergraduate students, plus postdocs. Multiple SNRI faculty have strong field and experimental research programs, affording excellent opportunities for graduate and undergraduate research training in developing measurement and analysis skills. SNRI faculty also teach field-based classes, and use data and facilities associated with SNRI research in their teaching. SNRIs impact on academic programs also involve providing a culture within which sustainability, resource management, environmental quality and public health are well regarded. Some examples follow.

- SNRI faculty-led Environmental Leadership Seminars were held in Yosemite during the summers, which included and benefitted Research Experience for Unergraduates and Yosemite Leadership program students.
- Graduate education programs were hosted at the Yosemite Field Station including the SNRI Scientific Visualization Fellowship, the NRS Mathias Grant, Environmental Leadership Seminars and grants for graduate students to work with faculty.
- On average over 50 graduate students have worked with SNRI faculty every year in the last 5 years.
- Undergraduate research experience is a hallmark of UC Merced and many undergraduates from several disciplines also work in the labs and in the field with SNRI faculty. There is a clear track record of undergrads matriculating into graduate degree programs as a direct result of their undergraduate experiences at UC Merced. Since 2010 we have had 787 Graduate students attend UC Merced. Of that group, 163(20.7%) attended UC Merced as undergraduates.
- The Research Experience for Undergraduates program through UC Merced has been funded by the National Science Foundation since 2008. Coordinated and directed by SNRI faculty, these students come from Universities throughout the US and the World. Student activities consist of individual research projects, spanning a broad range of disciplines such as ecology, geoscience,

biodiversity, conservation, restoration, hydrology, and engineering. Research training is provided by mentors from UCM (Schools of Natural Sciences, Engineering, and Social Sciences) and the USGS Western Ecological Research Center. Students also participate in a series of field trips led by teams of UCM, USGS, and NPS scientists focusing on Yosemite and the Sierra Nevada. All of the students attend a weekly seminar in Environmental Science. This program is paused for the summer of 2016 and SNRI faculty will be applying for funding for the summer of 2017 to continue the REU program.

- SNRI developed the Field Stations in Yosemite and Sequoia/Kings Canyon National Parks, which are now a part of the Natural Reserve System at UC Merced. Both field stations have and continue to be host locations for research, retreats, undergraduate and graduate program delivery and cooperative efforts with the National Parks.
- SNRI also supported the startup of the Campus Vernal Pool Natural Reserve Program which is now being administered by the Office of Research with a Faculty Director for the program.
- The SNRI Annual Reports from 2010 to 2015 are included here as attachments to reflect the quantity and quality of the yearly accomplishments and evolution of the SNRI over this timeframe. ***See SNRI Annual reports 2010 through 2015 page 105 through page 214***

2.3. **Diversity Goals**.

The faculty, researchers and staff of SNRI have cultivated a healthy atmosphere for diversity, which can be observed by the diversity of the faculty, staff and students of SNRI. In every area of the SNRI, actions toward diversity goals can be seen in the workplace, field sites, faculty, classrooms, subject areas of research and in the programming of public events and SNRI sponsored seminars and presentations. The Administrative office of SNRI has always been a diverse mix in all categories, gender, ethnicity and LGBT representation. SNRI is a healthy work and study atmosphere that can be experienced by just walking into the SNRI administrative offices and the offices of the support positions for the CZO and other programs of SNRI. The staff regularly attend trainings and support the events and outreach efforts of the SNRI leadership and faculty.

UC Merced is a designated Hispanic Serving Institution and this can be observed in every program area of the SNRI. Classrooms of undergrad and graduate students in SNRI related programs are populated by residents of the San Joaquin Valley, Southern and Northern California. Not only do you see ethnic diversity, but there is also socio-economic diversity in the student population at UC Merced. Up to 60% of the undergrad students at UC Merced are eligible for PELL grants. This includes students of white, Hmong, Latino, African American, and other ethnic backgrounds. SNRI students are an extraordinarily diverse group, ethnically, socially and geographically.

One of the values of this diversity is the focus on research questions that have to do with the wellbeing and understanding of the environmental and social health of the communities where the families of these students live. As UC Merced and the SNRI matures, students of the region, matriculating through the undergraduate to Post doctorate programs will be the bright minds, who in partnership with a diverse research staff and faculty, will discover the new knowledge that will improve the lives in the wild and urban communities of this region of California.

Diversity in the SNRI is achieved by the activation of the mission of this research unit partnered with a diverse student base, a diverse faculty, all communities, industry and government to improve lives by discovering and disseminating new knowledge about and for this region.

2.4. **Relationships to Other Academic Units**.

Following are examples of how SNRI interacts with other units on campus.

- The researchers and faculty who are members of SNRI are associated with the three schools at UC Merced, with the following approximate breakdown if faculty by affiliation: Natural Science

(18), Engineering (17), Social Science, Humanities and Arts (4). This results in regular research collaborations between the professors and researchers, their labs and their associated staff and students in the work of the SNRI.

- The faculty are also affiliated with other research units: UC Water (3), UC Solar (5), The Center for Climate Communications (16), the Health Sciences Research Institute (9) and CITRIS (10). UC Water, CITRIS and UC Solar are all multi-campus programs and there is regular partnership in research activities and deliverables including planning, grant writing, research activities, publications, presentations and sponsored events.
- SNRI has research relationships with the USGS, the USFS, the NPS and study sites on US Forest Service lands, National Park lands and NRS sites.
- SNRI has also developed research relationships with DOE labs and other federal research groups. SNRI faculty have led or participated in many large interdisciplinary research projects, such as the Southern Sierra Critical Zone Observatory (CZO), the Sierra Nevada Adaptive Management Project (SNAMP) and others noted above under faculty profiles.
- Professors in the School of Natural Science are working to build the first greenhouses on the campus and this effort has been supported in part by SNRI, The School of Natural Sciences, UC Solar and the facitlities and engineering staff at UC Merced. Each group contributed ideas, graduate student time and funds to implement the design and construction of the greenhouses.

One of the goals of the SNRI is to expand engagement with the Health Sciences Research Institute at UC Merced. There are nine (9) members of SNRI who are also affiliated with HSRI. Work done by SNRI affiliated faculty and researchers often intersects with environmental and health issues areas of study.

We created a matrix that shows all SNRI faculty and their areas of expertise, research focus and their role in the investigations (PI, collaborator, etc.). This matrix provides an overview of SNRI faculty and will help us identify areas where we could strengthen faculty inclusion (new members) and also offers for the SNRI members a one page view of their SNRI colleagues. This document will aid in the strategic planning and recruitment for SNRI affiliated faculty and researchers.

2.5. Public Service and Outreach.

There are hundreds of ways in which SNRI members and their research groups have made significant contributions to the public and the community beyond UC Merced. A few examples follow.

- SNRI in the last 5 years has continued to develop and maintain relationships with federal, State and local agencies as well as elected federal, state and local officials.
- The federal agency relationships include: National Park Service, US Forest Service, BLM, DOE, NSF, NASA, BOR, Dept of Agriculture, USGS , Army Corps, EPA, DOI, Fish and Wildlife Service and NOAA.
- Federal elected officials include members of Congress, the Senate and the Office of the President.
- The state agency relationships include: Department of Natural Resources, DWR, Ca Fish and Wildlife, Ca Dept of Forestry, Air Resources Control Board, Delta Stewardship Council, Cal EPA, State Parks, Sacramento-San Joaquin Delta Conservancy, Sierra Nevada Conservancy and State Universities
- State and regional elected officials include members of the State Assembly, the State Senate, Governor's Office, county and city officials as well as Irrigation District and Water District managers and Board members.
- SNRI has also developed and maintained relationships with several NGO's including: Resources Legacy Fund, Save the Redwoods League, California Parks Foundation, Moore Foundation and the Yosemite Conservancy.
- Working with Office of Development and Advancement, we have engaged corporate partners and individuals including Southern California Edison which has funded both graduate research positions and undergraduate scholarships.

- Many SNRI events are open to the public. SNRI participates annually Research Week at UCM by hosting a research symposium highlighting our research that is relevant to the region.
- SNRI has hosted open house events for the Park and Wawona community at the Yosemite Field Station and on campus.
- SNRI has hosted research events for the Sequoia-Kings Canyon Park staff and community, at Wolverton.
- SNRI faculty and students have participated at the Annual San Joaquin River festival every year
- SNRI students, faculty and staff participate in Bobcat Day and other on-campus events to engage students, families and the community.
- SNRI has hosted events and in the community, including two recent events at the Karmangar Theatre in downtown Merced: i) the authors of The West Without Water, Lynn Ingram and Frances Malamud-Roam presented to a full house and addressed the geologic history of major drought in the West; and ii) the author of Dodging Extinction, Anthony Barnosky, spoke about past extinctions and described the indications that we are heading into the 6th extinction. These events were free to the public and were attended by a wide variety and hundreds of guests from the Merced and surrounding community. Both events included a question and answer period between the audience members and discussion panels made up of SNRI faculty with the presenters.
- Since 2014, the *Science Café Merced* has held nine monthly events. This program which is supported by the SNRI staff with assistance in publicity, and onsite support continues to receive a very positive response from the audience as well as the host business, Coffee Bandits. During the introduction of guest speakers, the organizer gives credit to SNRI and the support provided by the staff. This forum represents an opportunity for SNRI faculty to present their work to the local Merced community in the future. Attendees are often a mix of UCM students, students from other schools in the Merced area, members of the public and UCM faculty and staff. Designed to fulfill the international Science Café model: an event hosting "*people who may or may not typically get involved with scientific discussions. They are not exclusive club meetings for scientists and science majors, nor do they take place exclusively in lecture halls or science museums"* (Science Café website).

Measures of success that may be relevant for SNRIs future activities follow. These include process metrics, as well as performance metrics (output, outcome, impact).

- Number and citation of peer-reviewed publications (from Google Scholar and ISI)
- Distribution of lead authors on papers by SNRI student, postdoc and faculty, versus outside collaborators (may be very time consuming).
- Ph.D. and M.S. graduation rates and post-graduation placement (e.g., number of graduates in faculty, post-doctoral, or industry positions).
- Track record of attracting talented project scientists, visiting scholars and postdoctoral scholars (number in residence per year).
- Student and faculty awards and honors (may be challenging to compile if not self reported)
- Amount and source of extramural faculty and student funding (awards and expenditures, depending on availability of data).
- Funding and staffing support for the Sierra Nevada Research Institute administration (process metric).
- Number and type of public and professional presentations (may be challenging to compile if not self reported).
- Number and type of general media coverage of student and faculty research (may be challenging to compile if not self reported).
- Impact on state and local policy by engagement with stakeholders (may be challenging to compile if not self reported).

- Collaboration among faculty, researchers, graduates students and partners.
- Research focus inventory continues to align with key critical issues in California and with priorities of the UCOP.
- Participation by SNRI faculty and researchers on UCOP advisory groups.
- Participation by SNRI faculty on regional, state and national panels focused on areas of SNRI study and research.
- Impact on quality of life for citizens of the region and state
- Positive impact on quality of conditions in systems studied my SNRI Researchers (rivers, forests, groundwater, air quality, water supply)
- Impact on development of state and local policies and practices as a result of SNRI research (impact metric challenging to quantify).
- External Directors Council is actively involved in reviewing research agenda of SNRI.

2.6. **Administration and Governance**.

The SNRI has a membership committee that reviews requests and recommends new members for SNRI, reviews members for continuing membership, and acts as a personnel committee for project scientists and research scientists. SNRI also has both a Faculty Advisory Committee and an external Directors Council. The Faculty Advisory Committee thus in part also fills some of the rols of an executive committee. In the past SNRI has not sought to have a separate executive committee, in part because most members already have large service loads and the issues could be handled by the advisory committee.

The Faculty Advisory Committee (UC Administrative Policies and Procedures Concerning ORU's UCOP 12/1999) is chaired by a faculty member and meets twice a year. This group sets the goals for the SNRI and evaluates the effectiveness of the organization. The Advisory Committee provides counsel to the Director on all matters pertaining to the unit, including strategic planning, goals, governance, budgetary matters and personnel. It is expected that the Chair and other members of the Advisory Committee will participate in the 5-year review process. The SNRI Advisory Committee is made up of faculty members and an external member from the National Park Service and USGS Research Branches. The SNRI Annual Reports 2010-11, 2011-12, 2012-13, 2013-14 (notes), 2014-15 are attached and contain meeting reports from the Advisory Committees. We have a mix of representative mix of faculty on the Advisory Committee and the members have generally all been active. There is a need to further engage faculty working in areas of Human Health and sustainability with the efforts of the Sierra Nevada Research Institute faculty and researchers.

The SNRI Directors Council has been in existence since 2011. This group is composed of leaders from industry, academia and the public sector and are intended to provide an external perspective as the Institute grows in its capacity to provide and disseminate new knowledge that sustains the environment and ecosystems of California and related regions worldwide. We have met on average, once per year. Our goal is to increase meetings to twice per year. Members of this Council are contacted throughout the year by SNRI Leadership and researchers as program areas intersect with Council member's areas of expertise and influence. We seek the support of these members in areas such as research and educational partnerships, understanding industry trends as they relate to faculty research foci and curriculum development. Philanthropic partnerships and support is an important objective of this Council as well as advocacy and legislative education. ***A formal description of the Council purpose and expectations is attached on Page 222.*** Because of staff workload issues, the Director's council last met in fall 2014. We are working to invigorate the External Director's Council in the following ways:

- Hold at least two meetings per academic year
- Include UCM Trustee(s) on the Council
- Increase membership in keeping with industry, societal and research trends
- Develop stronger philanthropic results in support of SNRI and UCM research objectives
- Assure research relevancy to the critical issues of the Sierra and San Joaquin Valley regions

2.7. Problems and Needs.

SNRI continues to manage a large volume of grants and additional dministrative support continues to be a high priority. Currently, the SNRI Office administers 8 vehicles outside of the campus fleet management program. The demand on administrative staff time for this effort is also significant. Discussions continue around options to move all of the vehicle fleet management to Fleet Services. The SNRI leadership recently prepared a Workforce Planning report which outlines current and requested staff positions. SNRI also expects to continue to increase the number of affiliated research scientists. To accommodate staff and affiliated faculty, we need additional office space, and potentially lab space.
See Workforce 5 year Strategic Plan attachment pages 223-228

2.8. Justification for Continuance.

SNRI can continue to provide significant value added to UC Merced as the university grows and reaches greater levels of maturity as a research institution. The need for a regionally focused institute within UC is now greater than ever, as the Sierra Nevada-Central Valley region struggle with unprecedented changes to regional ecosystems, agriculture, environmental quality, population, energy, economy and more. SNRI has a respected identity for research excellence and public service in the region, state and nationally; and can continue to provide that identity for UC Merced and UC as a whole. SNRI has incubated several successful programs and can continue program building activities for UC Merced.

The breadth and reach of SNRIs research partnerships and community engagement throughout the region, state, nation and world is a testament to the vision of the founders of UC Merced, and the creators of SNRI. Faculty and researchers work with State, Federal and local agencies as well as private landowners to concentrate the power of the UC on the critical questions facing the region. SNRI maintains this regional focus that the founders envisioned, using the region as a natural laboratory to address challenges around sustainability, resource management, environmental quality and public health. The areas of research represented by SNRI have contributed greatly to UC Merced's reputation as a research university, and are central to our ability to both chart a sustainable future and adapt to the unprecedented changes facing our society and ecosystems as the world's population increases and climate warms.

Sustainability is a signature research theme as a strategic academic direction for UC Merced. The following is from UC Merced's Strategic Vision. *"Build an integrated research and educational program on ecological systems, energy, water and other natural resources, climate change and security threats associated with global change that will help build a sustainable environment."* This describes precisely the work being done by the Sierra Nevada Research Institute's (SNRI) faculty and researchers.

The SNRI is perfectly poised and has demonstrated the ability to articulate the mission of the SNRI and UC Merced through relationships and effective research which includes; published work, editorial opinion pieces, interviews with the media and consulting with industry leaders in agricultural, watershed management, water research, climate change, drought and energy. In addition, elected officials, state and federal agencies continue to seek the advice of SNRI faculty on an array of issues critical to the State of California and the nation. In the last five years, thought leaders of SNRI have participated in academic and public arenas, discussing the full array of the research focus of our faculty and researchers. Along with the laboratory setting of the UC Merced campus, the SNRI team has developed strong research relationships throughout the San Joaquin Valley, the Sierra foothills and the Sierra Nevada. We continue to create partnerships and a presence in these living laboratories and extend the studies in the classroom and in the research setting to the realities of the region.
SNRI has effectively supported building and supporting research functions at UCM. Even a cursory scan of trends in academic research shows that there is significant potential for growth in the areas represented by SNRI, including federal, state and private extramural opportunities. We thus expect growth in funding by SNRI faculty to continue. Polling of SNRI faculty has confirmed that the proposal and grant loads will continue to increase. It should be noted that some SNRI faculty use pre-award and post-award services from the 3 schools. A few SNRI faculty are also members of HSRI and it may be more appropriate for them to run human-health grants through HSRI, and other grants through SNRI. Similar specialization

with the schools may create efficiency in allowing staff to specialize on certain agencies and faculty. However, a central function of an ORU is to provide efficient, timely support to its faculty and researchers, enabling them to be productive researchers and focus on discovery, analysis, publication and other creative service activities. At this point, we have not recommended moving any of the grant-funded support to a central administrative-support office. However, a central office could be used for the relatively small number of transactions that SNRI does in support of the Environmental Analytical Laboratory and others.

SNRI faculty and researchers continue to be very productive in obtaining grants, largely from federal and state agencies. On average, awards to SNRI faculty amounted to 37% of total campus research awards. Several of the research projects are collaborative with colleagues from other campuses and government research organizations, significantly expanding the impact of SNRI. With the proposed hires, we anticipate increased research funding and we also see opportunities for increasing the number and amount of gifts to SNRI projects and researchers.

We have attached a fundraising matrix with this review please see: ***Attachment page 260***
Some additional strategies under consideration follow.

- We have identified key projects and programs of SNRI, we will expand this matrix to include project lists by SNRI Faculty member and develop an approach for each project in partnership with Development.
- We are currently working with Development to increase the fundraising options for faculty. We have established agreements with the crowdfunding programs of "Indigogo" and "Benefunder".
- With one project scientist, we are engaging in a new campaign through Indigogo in April 2016.
- We will work with our external advisory board to identify philanthropic support for the programs of SNRI.
- We will promote the use of "Donate Now" buttons for SNRI projects and Faculty
- Currently developing one-pagers in partnership with UCM designers, UC Water and the CZO in order to create a strengthened brand and format for information and funding needs.
- Update the 2012-2017 SNRI Business Plan ***Attachment page 230 - 245***
- Update the 2012 SNRI Strategic plan ***Attachment page 246-259***

3. MEASURES OF SUCCESS

The measures of success for the SNRI are to be prepared in consultation with ORED. The list in Section 2.5, above, provides metrics to seed that consultation.

4. CAMPUS INFORMATION

a. Unit Profile

i. Names of (Co-) Directors, Acting Directors, and Associate Directors, and tenure of appointments.
Roger Bales*, Professor Engineering, Director 2008 – 2012, 2014-present*
Martha Conklin*, Professor Engineering, Acting Director 2013-2014*
David Hosley, *Executive Director, 2010-2012*
Steve Shackelton*, Executive Director, 2013-14*
Armando Quintero*, Executive Director, 2015-present*

ii. Members of Executive and Advisory Committees, including members' titles, affiliations, and dates and terms of membership.

2010-13 SNRI Advisory Committee
Steve Hart Professor *of Engineering, Chair*
Roger Bales *Professor of Engineering and Faculty Director, SNRI*
Henry Forman *Professor of Natural Sciences*
Tom Harmon *Professor of Engineering*
Kathleen Hull *Associate Professor of Social Science, Humanities and the Arts*

Leroy Westerling *Associate Professor of Engineering*
David Graber *Chief Scientist, Pacific West Region, National Parks Service*

2014-15 SNRI Advisory Committee
Kathleen Hull *Associate Professor of Social Science, Humanities and the Arts (Chair)* Josh Viers*, Associate Professor of Water Resources – Director, CITRIS UC Merced* Michael Dawson*, Professor of Natural Sciences*
Asmeret Asefaw Berhe*, Associate Professor of Soil Biochemistry*
YangQuan Chen*, Associate Professor School of Engineering*
External: Koren Nydick*, Resources Manager, Sequoia/Kings Canyon National Parks*

2010-present SNRI Directors Council
Michael Eaton, *Retired Conservation Manag*er (2011-present)
Este Stefil, *BLM District Manager* (2013-present)
Jaymee Marti, *Ecological Consulta*nt (2013-present)
Monte Mitchell, *Water Resources Manager*, Ag (2013-present)
Lynn Huntsinger, *Professor, College of Natural Resources UCB* (2013-present)
Keith Gilless, *Dean and Professor of Forest Economics UCB (2013-present)*
Caryl Hart, *Director Sonoma County Parks* (2011-present)
Ed Smith, *Nature Conservancy* (2013-present)
Jay Chamberlin, *Chief of Resources, Ca State Par*ks (2013-present)
Cynthia Kohler, *ED, Water No*w (2013-present)
Kim Stanley Robinson, *Author* (2013-present)
Richard Moss, *Principal, Provost and Pritchard Consulting Group* (2011-present)
Mike Chrisman, *Director, Southwestern Partnership Office, NFWF* (2010-2012)
Gary Freeman, *Principal Hydrologist and Manager of Water Management and Power, PG&E* (2011-2013)
Bill Phillimore, *EVP, Paramount Farms* (2011-2014)
Tim Quinn, *ED Association of California Water Agencies* (2011-2013)

iii. Names of UC Merced faculty who were/are members of the ORU, including their departments and dates of affiliation.

1. Aguilar, Andreas – Professor, School of Natural Sciences (2009 – 2013)
2. Ardell, David – Assistant Professor, School of Natural Sciences (2010-present)
3. Bales, Roger - Professor, School of Engineering, Director SNRI, Director UC Water (2003-present)
4. Beman, Michael - Assistant Professor, School of Natural Sciences (2009-present)
5. Berhe, Asmeret Asefaw – Associate Professor, School of Natural Sciences (2009-present)
6. Blois, Jessica - Assistant Professor, School Natural Sciencies (2013-present)
7. Marc Buetel – Associate Professor, School of Engineering (2015-present)
8. Campbell, Elliott - Associate Professor, School of Engineering (2010-present)
9. Chen, Yang Quan – Associate Professor, School of Engineering (2013-present)
10. Chen, Yihsu - Associate Professor, School of Engineering (2010-present)
11. Conklin, Martha - Professor, School of Engineering, Director of UC Merced Natural Reserve System (2003-present)
12. Dawson, Michael - Associate Professor, School of Natural Sciences (2006-present)
13. Dayrat, Benoit – Professor, Assistant Professor, School of Natural Sciences (2009 – 2014)
14. Edwards, Danielle – Assistant Profesor, School of Natural Sciences (2015 – present)
15. Matlock, Teenie – Associate Professor, School of Social Sciences, Humanities & Arts (2009-present)
16. Moran, Emily – Assistant Professor, School of Natural Sciences (2014-present)

17. Diaz, Gerardo - Associate Professor, School of Engineering (2005-present)
18. Fogel, Marilyn – Professor, School of Natural Sciences (2013-present)
19. Forman, Henry – Professor, School of Natural Sciences (2005-2015)
20. Frank, Carolin - Assistant Professor, School of Natural Sciences (2011-present)
21. Ghezzehei, Teamrat A. – Associate Professor, School of Natural Sciences (2009-present)
22. Guo, Qinghua – Associate Professor, School of Engineering (2005-present)
23. Harmon, Tom – Professor, School of Engineering (2005-present)
24. Hart, Stephen – Professor, School of Natural Sciences (2008-present)
25. Hull, Kathleen – Associate Professor, School of Social Sciences, Humanities and the Arts (2006-present)
26. Innes, Robert - Professor, School of Social Sciences, Humanities and the Arts (2009-present)
27. Joyce, Andrea – Assistant Professor, School of Social Sciences, Humanities and the Arts (2011-present)
28. Kueppers, Lara – Assistant Professor, School of Natural Sciences (2006-2013)
29. Leppert, Valerie – Associate Professor, School of Engineering (2005-present)
30. O'Day, Peggy – Professor, School of Nat.Sci,Chair Environmental Systems Graduate Program (2005-present)
31. Rice, Robert – Lecturer, School of Engineering (2006-present)
32. Rolland, Erik – Interim Dean and Professor, School of Engineering (2012-present)
33. Rogge, Wolfgang - Associate Professor, School of Engineering (2008-present)
34. Sexton, Jason - Assistant Professor, School of Natural Sciences (2014-present)
35. Traina, Samuel – Vice Chancellor for Research and Economic Development, Professor Engineering (2003-present)
36. Westerling, Le Roy – Associate Professor, School of Engineering (2010-present)
37. Winston, Roland – Professor, School of Engineering, Director UC SOLAR (2008-present)
38. Viers, Joshua – Professor, School of Engineering, Director CITRIS (2013 –present)
39. Wright, Jeff – Professor, School of Engineering, Director CITRIS (2009-2011)

iv. Names of faculty who have agreed to participate in the ORU's activities over the next five years.

It is expected that all faculty listed above (iii) who remain affiliated with UC Merced will participate over the next 5 years. It is expected that the SNRI membership committee will review all faculty's membership and activity status in AY 2016-17.

v. Names of UC Merced professional researchers who have appointments in the ORU, including appointment dates.

1.	Burkhart, John	4-1-11 through 8-31-13
2.	Hilton, Tim	1-1-15 through 1-31-16
3.	Jepsen, Steven	2-28-14 to present
4.	Hunsaker, Carolyn	7-1-09 to present
5.	Kueppers, Lara	7-1-15 through 6-30-16
6.	Miller, Norman	retired 12-31-15
7.	Pathak, Tapan	2-2-15 to present
8.	Quinn, Nigel	3-1-13 through 12-31-15
9.	Rice, Robert	8-16-12 to present
10.	Safeeq, Mohammad	9-ll-14 to present
11.	Stephens, Molly	9-14 to present
12.	Vincent, Emmanuel	7-1-15 to present

vi. Names, home universities, and dates at UC Merced of all visitors who have conducted research as visiting researchers or visiting graduate students during the last five years, including source of support. ***Attachment pages 261-267***

vii. Names of undergraduates, graduate students, postdoctoral scholars, their advisors, dates of association with the ORU, and, for graduate students, their department and Masters degree and/or PhD degree conferral date.

Attachment page 268-271 listed by professor

ix. Description of seminar, lecture, and conference programs. SNRI Faculty, researchers and students have presented hundreds of seminars at other institutions, public lectures and conference programs, however at this point, complete lists of the these for all SNRI participants are not available to SNRI Staff. This capture of information is something we are in the process of correcting for future annual and 5-year reports.

x. Listing of all publications and other scholarly works that have appeared under the auspices of the ORU.The following attachment includes over 1,000 published articles/reports by SNRI faculty and researchers.
Attachment - Faculty Bibliography beginning on page 19

xi. Physical Facilities and Space Description of the physical facilities housing the ORU:

Two administrative office spaces in Science and Engineering Building 1 –

S&E 1 206 (160 sq ft) Executive Director, Administrative Officer, 1 Student

S&E 1 208 (321 sq ft) MSO, Research Administrator, Analyst, 3 student assistants

One Conference room in Science and Engineering Building 1, Room 200 (486 sq ft) Administrative Office Building

AOB 125 Office (109 sq ft) 2 SNRI Post Docs

AOB 144 Office (107 sq ft) SNRI hosts EAL Staff

AOB 145 Office (110 sq ft) SNRI hosts NRS Reserve Staff

xii. Financial Data

All income received by the ORU for each fiscal year covered in this report.
Federal, state, local, and international grants and contracts
Foundations and private gifts:
UC Merced and other UC-derived funds.
Expenditures for personnel in both FTE and dollars for each fiscal year since the last review:Research and student personnel listed by title (Professor, Postdoctoral Scholar, Associate Research Physicist, Specialists, Graduate and Undergraduate students, etc.); **See attachment 5 year Expenditures for SNRI ORU Page 272-284**

SNRI Administrative Personnel as of Fall 2015:

SNRI Director – Roger Bales

SNRI Executive Director – Armando Quintero

Management Services Officer - Coty Ventura

Research Administrator - Vacant

Administrative Officer – Alexis Valle-Arevalo

Analyst – Crystal Galvan Student

Assistant – Andre Frise

Student Assistant – Patrick Woodbury

Student Assistant – Vinke Menardo

Student Assistant – Andrew Martinez

The ORU Self-Assessment Instructions

To begin a review, an ORU develops a formal proposal for continuation of ORU status, and requests supporting funds and space in the context of current campus and University needs and resources. The review proposal should include the following:

1. The ORU's goals and objectives should be listed, detailing any projected changes to the mission and objectives of the ORU if it is continued. If an ORU proposes to change its name as the result of new research directions or the addition of new fields of research to the unit's mission, the Director will describe the rationale for requesting a new name as part of the review process.

2. Evidence of Accomplishments should be provided, focusing primarily on the preceding five years. The unit's success in meeting the mission and goals previously identified and agreed to by the ORU and ORED should be evaluated. Key elements of this discussion include:

Research. The relevant discussion here may include comments on the quality and significance of completed and ongoing research; significant trends within disciplines represented and their relationship to current research specialties in the ORU; added value and capabilities the ORU has brought to the campus, which would have been difficult to achieve within other campus structures; continuing productivity and influence of ORU participants, locally as well as nationally and internationally; evidence of prominence in the fields represented in the ORU; a description of the ORU's collaborative interdisciplinary work and the quality and impact of the work on other research efforts across campus; degree of postdoctoral scholar training within the ORU; importance of the ORU to Visiting Scholars; contributions to professional development of the ORU's professional staff and faculty; and descriptions of possible sources and availability of extramural funds to support the ORU's research.

Graduate and Undergraduate Research Training. Relevant issues to consider include:

What are the contributions made by the ORU toward graduate and undergraduate research training?

What is the ORU's impact on existing academic programs and units, including the benefits to the teaching programs of the participating faculty members' departments?

Diversity Goals. How has the ORU contributed to campus diversity goals? Contributions to diversity and equal opportunity can take a variety of forms, including efforts to advance equitable access to education, public service that addresses the needs of California's diverse population, or research in a scholar's area of expertise that highlights inequities.

Relationships to Other Academic Units. Questions to address may include: How does the unit interact with other similar units in other research centers or

institutions? Are there additional relationships the unit could be exploring that are not currently being pursued? If so, what are the impediments?

Public Service and Outreach. How has the ORU made significant contributions to the public and the community beyond UC Merced? Measures of success can include, for example, intellectual property that is brought to market; research that improves the quality of life for citizens; and events hosted by the ORU that engage the public's interest. What are the measures of success for the unit's future activities?

Administration and Governance. Describe the ORU's Advisory and Executive Committees. What are their roles, how often do they meet, and how well do they function? Are any changes needed to the Advisory, Executive, or other governance committees? Is there adequate and planned turnover of Advisory Committee members to ensure that new ideas and perspectives will be presented over time?

Problems and Needs. Describe any constraints which prevent the ORU from functioning at an optimal level.

Justification for Continuance. Describe the ORU's plans for the next five years. It should be made clear to reviewers how the ORU's plans will evolve from the situation presented in the self-assessment. Plans for external fundraising should be addressed.

3. In consultation with ORED, clearly define measures of success appropriate for the research focus of the ORU. These measures will then be used in subsequent review of the ORU to determine the degree of the unit's success.

4. Campus Information including:

a. Unit Profile

i. Names of (Co-) Directors, Acting Directors, and Associate Directors, and tenure of appointments.

ii. Members of Executive and Advisory Committees, including members' titles, affiliations, and dates and terms of membership.

iii. Names of UC Merced faculty who were/are members of the ORU, including their departments and dates of affiliation.

iv. Names of faculty who have agreed to participate in the ORU's activities over the next five years.

v. Names of UC Merced professional researchers who have appointments in the ORU, including appointment dates.

vi. Names, home universities, and dates at UC Merced of all visitors who have conducted research as visiting researchers or visiting graduate sduetns during the last five years, including source of support.

vii. Names of undergraduates, graduate students, postdoctoral scholars, their advisors, dates of association with the ORU, and, for graduate students, their department and Masters degree and/or PhD degree conferral date.

viii. Description of any university-industry and university-government activities.

ix. Description of seminar, lecture, and conference programs.

x. Listing of all publications and other scholarly works that have appeared under the auspices of the ORU.

b. Physical Facilities and Space Description of the physical facilities housing the ORU, including:

i. type of space (laboratories, studios, seminar rooms, professional research staff offices, administrative offices, etc.)

ii. assignable square footage

iii. location.

c. Financial Data

i. All income received by the ORU for each fiscal year since it was last reviewed from:

- Federal, state, local, and international grants and contracts;
- Foundations and private gifts;
- Industrial grants
- UC Merced and other UC-derived funds.
- Recharge income if applicable

ii. Expenditures for personnel in both FTE and dollars for each fiscal year since the last review:

- Research and student personnel listed by title (Professor, Postdoctoral Scholar, Associate Research Physicist, Specialists, Graduate and Undergraduate students, etc.);
- Technical staff by title (Development Engineer, SRA, Computer Programmer, etc.);
- Administrative staff by title (MSO, Accountant, Secretary, etc.);
- Equipment purchases;
- Supplies and expenses.

SNRI Faculty Publications 2010 -2015

Please note: Not all information is available for all citations.
For papers with numerous co-authors, we will list faculty author's name and the number of co-authors

Faculty Member	Publication
Aguilar, Andres	J.D. Baumsteiger*, A.P. Kinziger, S. B. Reid, & A. Aguilar. Complex phylogeography and historical hybridization between sister taxa of freshwater sculpin (Cottus). Molecular Ecology 23: 2602s 2618. (2014.)
Aguilar, Andres	J.D. Baumsteiger* & A. Aguilar. 2014. Impact of dams on distribution and hybridization of two species of California freshwater sculpin (Cottus) Conservation Genetics 15: 729s 742.
Aguilar, Andres	V. Buonaccorsi, M. Peterson, G. Lamendella, J. Newman, N. Trun, T. Tobin, A. Aguilar A. Hunt, C. Praul, D. Grove, J. Roney & Roberts, W. 2014. Vision and change through the genome consortium for active teaching using nexts generation sequencing (GCATs SEEK). CBEs Life Sciences Education, 13: 1s 2.
Aguilar, Andres	A. Aguilar, R.B. Douglas, E. Gordon, J.D. Baumsteiger*, & M.O. Goldsworthy. 2013. Elevated genetic structure in the coastal tailed frog (Ascaphus truei) in managed redwood forests. Journal of Heredity. 102: 202s 216.
Aguilar, Andres	J.D. Baumsteiger* & A. Aguilar. 2013. Nine original microsatellite loci in prickly sculpin (Cottus asper) and their applicability to other closely related Cottus species. Conservation Genetics Resources. 5: 279s 282.
Aguilar, Andres	J.D. Baumsteiger*, A.P. Kinziger & A. Aguilar. 2012. Life history and biogeographic diversification of an endemic Western North American freshwater fish clade using a comparative species tree approach. Molecular Phylogenetics and Evolution. 65: 940s 952.
Aguilar, Andres	A. Aguilar. 2012. Ranges wide and local drivers of genetic structure in an endangered California vernal pool endemic crustacean. Conservation Genetics. 13: 1577s 1588.
Aguilar, Andres	J.G. Soñanezs Organis, J.P. Vázquezs Medina, A. Aguilar, D.E. Crocker, & R.M. Ortiz. 2012. Hypoxanthines guanine phosphoribolsyl transferase and hypoxia inducible factors 1α & s 2ß: cDNA characterization and tissue expression during prolonged fasting in northern elephant seal pups. Journal of Experimental Biology 215: 1448s 1455.
Aguilar, Andres	E. Velarde, C.J. Navarro, E.A. Ruiz, & A. Aguilar. 2012. The status of Craveri's murrelet Synthliboramphus craveri and reoccupation of a former nesting area. Marine Ornithology 39: 269s 273.
Aguilar, Andres	J. Heras*, B.F. Koop. & A. Aguilar. 2011. A Transcriptomic scan for positively selected genes in two closely related marine fishes: Sebastes caurinus and S. rastrelliger. Marine Genomics. 4: 93s 98.
Aguilar, Andres	A.N. Martinez* & A. Aguilar. 2011. Development of fiftys one novel ESTs SSR loci for use in rockfish (genus Sebastes). Conservation Genetics Resources. 3: 335s 340.

Aguilar, Andres	A. Aguilar. 2010. Weak Phylogeographic structure in the western North American fairy shrimp Branchinecta lynchi (Eng, Belk, & Erickson 1996). Aquatic Sciences. 73: 15-20.
Ardell, David	Dynamic regulation of mRNA decay during neural development DA Burow, MC Umeh-Garcia, MB True, CD Bakhaj, DH Ardell, MD Cleary Neural development 10 (1), 1
Ardell, David	Initiator tRNA Genes Template the 3' CCA End at High Frequencies in Bacteria DH Ardell, YM Hou bioRxiv, 035220
Ardell, David	FAST: FAST Analysis of Sequences Toolbox TJ Lawrence, KT Kauffman, KCH Amrine, DL Carper, RS Lee, PJ Becich, ... Frontiers in genetics 6
Ardell, David	Eye movements during listening reveal spontaneous grammatical processing S Huette, B Winter, T Matlock, DH Ardell, M Spivey Frontiers in psychology 5, 410
Ardell, David	tRNA signatures reveal a polyphyletic origin of SAR11 strains among alphaproteobacteria KCH Amrine, WD Swingley, DH Ardell PLoS Comput Biol 10 (2), e1003454
Ardell, David	Genetic encryption DH Ardell US Patent 8,592,199
Ardell, David	Ancestral genome organization: an alignment approach P Holloway, K Swenson, D Ardell, N El-Mabrouk Journal of Computational Biology 20 (4), 280-295
Ardell, David	Spontaneous eye movements during passive spoken language comprehension reflect grammatical processing S Huette, B Winter, T Matlock, D Ardell, M Spivey
Ardell, David	cMcpy: Genetic code-Message coevolution Models in python PJ Becich, BP Stark, HS Bhat, DH Ardell Evolutionary bioinformatics online 9, 111
Ardell, David	Evolution of genome organization by duplication and loss: An alignment approach P Holloway, K Swenson, D Ardell, N El-Mabrouk Research in computational molecular biology, 94-112
Ardell, David	AntisenseRNA: fast, specific target prediction for bacterial sRNAs through models of interaction and evolutionary conservation J Reimegård, D Ardell, GEH Wagner

Bales, Roger	Topographic and vegetation effects on snow accumulation in the southern Sierra Nevada: a statistical summary from lidar data Z Zheng, PB Kirchner, RC Bales The Cryosphere 10 (1), 257-269
Bales, Roger	Skill assessment of water supply forecasts for western Sierra Nevada watersheds B Harrison, R Bales Journal of Hydrologic Engineering, 04016002
Bales, Roger	Skill Assessment of Water Supply Outlooks in the Colorado River Basin B Harrison, R Bales Hydrology 2 (3), 112-131
Bales, Roger	Orographic and vegetation effects on snow accumulation in the southern Sierra Nevada: a statistical summary from LiDAR data Z Zheng, PB Kirchner, RC Bales The Cryosphere Discussions 9, 4377-4405
Bales, Roger	The Role of Critical Zone Observatories in Critical Zone Science T White, S Brantley, S Banwart, J Chorover, W Dietrich, L Derry, K Lohse, ... Elsevier
Bales, Roger	Soil moisture response to snowmelt timing in mixed-conifer subalpine forests AA Harpold, NP Molotch, KN Musselman, RC Bales, PB Kirchner, ... Hydrological Processes 29 (12), 2782-2798
Bales, Roger	LiDAR measurement of seasonal snow accumulation along an elevation gradient in the southern Sierra Nevada, California PB Kirchner, RC Bales, NP Molotch, J Flanagan, Q Guo Hydrology and Earth System Sciences 18 (10), 4261-4275
Bales, Roger	Antarctic-wide array of high-resolution ice core records reveals pervasive lead pollution began in 1889 and persists today JR McConnell, OJ Maselli, M Sigl, P Vallelonga, T Neumann, H Anschütz, ... Scientific reports 4
Bales, Roger	Seasonal Accumulation and Depletion of Local Sediment Stores of Four Headwater Catchments SE Martin, MH Conklin, RC Bales Water 6 (7), 2144-2163
Bales, Roger	Estimated Loss of Snowpack Storage in the Eastern Sierra Nevada with Climate Warming RC Bales, R Rice, SB Roy Journal of Water Resources Planning and Management 141 (2), 04014055

Bales, Roger	LiDAR-derived snowpack data sets from mixed conifer forests across the Western United States AA Harpold, Q Guo, N Molotch, PD Brooks, R Bales, JC Fernandez-Diaz, ... Water Resources Research 50 (3), 2749-2755
Bales, Roger	Comparison of Skill Assessments of Water Supply Forecasts for the Western Sierra Nevada and the Colorado River Basin B Harrison, R Bales Skill evaluation of water supply forecasts in western Sierra Nevada and …
Bales, Roger	Skill assessment of water supply outlooks in the Colorado River basin B Harrison, R Bales Skill evaluation of water supply forecasts in western Sierra Nevada and …
Bales, Roger	Atmospheric nitric oxide and ozone at the WAIS Divide deep coring site: a discussion of local sources and transport in West Antarctica S Masclin, MM Frey, WF Rogge, RC Bales Atmospheric Chemistry and Physics 13 (17), 8857-8877
Bales, Roger	Controls of streamflow generation in small catchments across the snow–rain transition in the Southern Sierra Nevada, California F Liu, C Hunsaker, RC Bales Hydrological Processes 27 (14), 1959-1972
Bales, Roger	Department of Hydrology and Water Resources RC Bales Seasonal Snowpacks: Processes of Compositional Change 28, 139
Bales, Roger	Department of Hydrology and Water Resources The University of Arizona Tucson, Arizona. 85721 RC Bales, J Choi Chemical Exchange Between the Atmosphere and Polar Snow 43, 319
Bales, Roger	Sensor placement strategies for snow water equivalent (SWE) estimation in the American River basin SC Welch, B Kerkez, RC Bales, SD Glaser, K Rittger, RR Rice Water Resources Research 49 (2), 891-903 5 2013
Bales, Roger	PHYSICAL AND CHEMICAL FACTORS CONTROLLING GASEOUS DEPOSITION OF S02 T0 RC Bales, MP Waldez, GA Dawson, DA Stanley Seasonal Snowcovers: Physics, Chemistry, Hydrology 211, 289 2012
Bales, Roger	Response to “Comment on ‘Soil Moisture Response to Snowmelt and Rainfall in a Sierra Nevada Mixed-Conifer Forest’”

	JW Hopmans, RC Bales, AT O'Geen, CT Hunsaker, D Beaudette, ... Vadose Zone Journal 11 (4), vzj2012. 0004r
Bales, Roger	Elevation-dependent influence of snow accumulation on forest greening E Trujillo, NP Molotch, ML Goulden, AE Kelly, RC Bales Nature Geoscience 5 (10), 705-709
Bales, Roger	Design and performance of a wireless sensor network for catchment-scale snow and soil moisture measurements B Kerkez, SD Glaser, RC Bales, MW Meadows Water Resources Research 48 (9)
Bales, Roger	Evapotranspiration along an elevation gradient in California's Sierra Nevada ML Goulden, RG Anderson, RC Bales, AE Kelly, M Meadows, GC Winston Journal of Geophysical Research: Biogeosciences 117 (G3)
Bales, Roger	Influence of canopy structure and direct beam solar irradiance on snowmelt rates in a mixed conifer forest KN Musselman, NP Molotch, SA Margulis, PB Kirchner, RC Bales Agricultural and Forest Meteorology 161, 46-56
Bales, Roger	Snowmelt runoff and water yield along elevation and temperature gradients in California's Southern Sierra Nevada1 CT Hunsaker, TW Whitaker, RC Bales JAWRA Journal of the American Water Resources Association 48 (4), 667-678
Bales, Roger	Inconsistencias temporales en los patrones espaciales del equivalente de agua en nieve: regresiones entre telemetría de nieve y topografía en la cuenca del río Colorado SR Fassnacht, KA Dressler, DM Hultstrand, RC Bales, G Patterson Pirineos 167, 165-185
Bales, Roger	Water yield and runoff timing across the rain-snow transition in California's southern Sierra Nevada C Hunsaker, T Whitaker, RC Bales Hydrological Processes
Bales, Roger	Temporal inconsistencies in coarse-scale snow water equivalent patterns: Colorado River Basin snow telemetry-topography regressions SR Fassnacht, KA Dressler, DM Hultstrand, RC Bales, G Patterson Pirineos, 165-185
Bales, Roger	Greenland Ice Sheet surface mass balance 1870 to 2010 based on Twentieth Century Reanalysis, and links with global climate forcing E Hanna, P Huybrechts, J Cappelen, K Steffen, RC Bales, E Burgess, ...

	Journal of Geophysical Research: Atmospheres 116 (D24)
Bales, Roger	Snow water equivalent along elevation gradients in the Merced and Tuolumne River basins of the Sierra Nevada R Rice, RC Bales, TH Painter, J Dozier Water Resources Research 47 (8)
Bales, Roger	Soil moisture response to snowmelt and rainfall in a Sierra Nevada mixed-conifer forest RC Bales, JW Hopmans, AT O'Geen, M Meadows, PC Hartsough, ... Vadose Zone Journal 10 (3), 786-799
Bales, Roger	Sampling strategies in forest hydrology and biogeochemistry RC Bales, MH Conklin, B Kerkez, S Glaser, JW Hopmans, CT Hunsaker, ... Forest Hydrology and Biogeochemistry, 29-44
Bales, Roger	Future directions for critical zone observatory (CZO) science RS Anderson, S Anderson, AK Aufdenkampe, R Bales, S Brantley, ... CZO Community 29
Bales, Roger	A spatially calibrated model of annual accumulation rate on the Greenland Ice Sheet (1958–2007) EW Burgess, RR Forster, JE Box, E Mosley-Thompson, DH Bromwich, ... Journal of Geophysical Research: Earth Surface 115 (F2)
Bales, Roger	Embedded-sensor network design for snow cover measurements around snow pillow and snow course sites in the Sierra Nevada of California R Rice, RC Bales Water Resources Research 46 (3)
Beman, Michael	Microbial diversity and community structure along a lake elevation gradient in Yosemite National Park, California, USA CJ Hayden, JM Beman Environmental microbiology 2 2015
Beman, Michael	Soil microbial community structure is unaltered by plant invasion, vegetation clipping, and nitrogen fertilization in experimental semi-arid grasslands CJ Carey, JM Beman, VT Eviner, CM Malmstrom, SC Hart Frontiers in microbiology 6 2015
Beman, Michael	Transcriptomic evidence for microbial sulfur cycling in the eastern tropical North Pacific oxygen minimum zone MT Carolan, JM Smith, JM Beman Frontiers in microbiology 6 1 2015
Beman, Michael	High abundances of potentially active ammonia-oxidizing bacteria and archaea in oligotrophic, high-altitude lakes of the Sierra Nevada, California, USA

	CJ Hayden, JM Beman PloS one 9 (11), e111560 3 2014
Beman, Michael	Activity, abundance, and diversity of nitrifying archaea and denitrifying bacteria in sediments of a subtropical estuary: Bahía del Tóbari, Mexico JM Beman Estuaries and Coasts 37 (6), 1343-1352 5 2014
Beman, Michael	Ocean-scale patterns in community respiration rates along continuous transects across the Pacific Ocean JM Wilson, R Severson, JM Beman PloS one 9 (7), e99821 1 2014
Beman, Michael	Abundance, Activity, and Diversity of Ammonia-oxidizing Bacteria and Archaea in Oligotrophic Alpine Lakes of Yosemite National Park, California J Beman, C Hayden AGU Fall Meeting Abstracts 1, 06 2013
Beman, Michael	Nitrite oxidation in the upper water column and oxygen minimum zone of the eastern tropical North Pacific Ocean JM Beman, JL Shih, BN Popp The ISME journal 7 (11), 2192-2205 21 2013
Beman, Michael	Deoxygenation alters bacterial diversity and community composition in the ocean's largest oxygen minimum zone JM Beman, MT Carolan Nature communications 4 11 2013
Beman, Michael	Oceanographic and biological effects of shoaling of the oxygen minimum zone WF Gilly, JM Beman, SY Litvin, BH Robison Annual Review of Marine Science 5, 393-420 59 2013
Beman, Michael	Quantification of ammonia oxidation rates and the distribution of ammonia-oxidizing Archaea and Bacteria in marine sediment depth profiles from Catalina Island, California JM Beman, VJ Bertics, T Braunschweiler, JM Wilson Front. Microbiol 3 (263), 10.3389 10 2012
Beman, Michael	Quantification of ammonia oxidation rates and ammonia-oxidizing archaea and bacteria at high resolution in the Gulf of California and eastern tropical North Pacific Ocean JM Beman, BN Popp, SE Alford Limnol. Oceanogr 57 (3), 711-726 41 2012
Beman, Michael	Energy Economics in Ecosystems J Beman Nature Education Knowledge 3 (10), 13 2012
Beman, Michael	Nitrogen in the Yaqui Valley: Sources, transfers, and consequences

	T Ahrens, J Harrison, M Beman, P Jewett, P Matson Seeds of Sustainability, 171-195 1 2012
Beman, Michael	From Wheat to Waves and Back Again: Connections between the Yaqui Valley and the Gulf of California M Beman, A Luers Seeds of Sustainability, 93-104 2012
Beman, Michael	Marine bacterial, archaeal and protistan association networks reveal ecological linkages JA Steele, PD Countway, L Xia, PD Vigil, JM Beman, DY Kim, CET Chow, ... The ISME journal 5 (9), 1414-1425 155 2011
Beman, Michael	Co-occurrence patterns for abundant marine archaeal and bacterial lineages in the deep chlorophyll maximum of coastal California JM Beman, JA Steele, JA Fuhrman The ISME journal 5 (7), 1077-1085 30 2011
Beman, Michael	Global declines in oceanic nitrification rates as a consequence of ocean acidification JM Beman, CE Chow, AL King, Y Feng, JA Fuhrman, A Andersson, ... Proceedings of the National Academy of Sciences 108 (1), 208-213 154 2011
Beman, Michael	Population ecology of nitrifying Archaea and Bacteria in the Southern California Bight JM Beman, R Sachdeva, JA Fuhrman Environmental microbiology 12 (5), 1282-1292 59 2010
Berhe, Asmeret Asefaw	Soil carbon and nitrogen erosion in forested catchments: implications for erosion-induced terrestrial carbon sequestration EM Stacy, SC Hart, CT Hunsaker, DW Johnson, AA Berhe Biogeosciences 12 (doi:10.5194/bg-12-4861-2015), 4861-4874 1 2015
Berhe, Asmeret Asefaw	Soil and Human Security in the 21st Century R Amundson, AA Berhe, J Hopman, C Olson, D Sztein, E., Sparks Science 348 (6235), DOI: 10.1126/science.1261071 34 2015
Berhe, Asmeret Asefaw	Decreases in soil moisture and organic matter quality suppress microbial decomposition following a boreal forest fire SR Holden, AA Berhe, KK Treseder Soil Biology and Biochemistry 87, 1-9 2 2015
Berhe, Asmeret Asefaw	Decomposition of distinct organic matter pools is regulated by moisture status in structured wetland soils C Arnold, TA Ghezzehei, AA Berhe Soil Biology and Biochemistry 81, 28-37 2015

Berhe, Asmeret Asefaw	How air-drying and rewetting modify soil organic matter characteristics: An assessment to improve data interpretation and inference M Kaiser, M Kleber, AA Berhe Soil Biology and Biochemistry 80, 324-340 6 2015
Berhe, Asmeret Asefaw	Early Spring, Severe Frost Events, and Drought Induce Rapid Carbon Loss in High Elevation Meadows C Arnold, TA Ghezzehei, AA Berhe PLOS ONE 9 (9), e106058 6 2014
Berhe, Asmeret Asefaw	Biochar can be used to recapture essential nutrients from dairy wastewater and improve soil physico-chemical properties TA Ghezzehei, DV Sarkhot, AA Berhe Solid Earth 5, 953-962. DOI 10.5194/se-5-953-2014 4 2014
Berhe, Asmeret Asefaw	Impact of fire on active layer and permafrost microbial communities and metagenomes in an upland Alaskan boreal forest N Taş, E Prestat, JW McFarland, KP Wickland, R Knight, AA Berhe, ... The ISME journal 8 (9), 1904-1919 19 2014
Berhe, Asmeret Asefaw	Soil erosion controls on biogeochemical cycling of carbon and nitrogen AA Berhe, C Arnold, E Stacy, R Lever, E McCorkle, SN Araya Nature Education Knowledge 5 (8), 2 3 2014
Berhe, Asmeret Asefaw	Influence of Calcium Carbonate and Charcoal Applications on Organic Matter Storage in Silt-Sized Aggregates Formed during a Microcosm Experiment M Kaiser, TA Ghezzehei, M Kleber, DD Myrold, AA Berhe Soil Science Society of America Journal 3 2014
Berhe, Asmeret Asefaw	Biochar can be used to recapture essential nutrients from dairy wastewater and improve soil quality TA Ghezzehei, DV Sarkhot, AA Berhe Solid Earth Discussions 6, 1101-1125 2014
Berhe, Asmeret Asefaw	Corrigendum to “Impacts of organic matter amendments on carbon and nitrogen dynamics in grassland soils” [Soil Biol. Biochem. 68 (2014) 52–61] R Ryals, M Kaiser, MS Torn, A Asefaw Berhe, WL Silver Soil Biology and Biochemistry 78, 340 22* 2014
Berhe, Asmeret Asefaw	Magnetic properties of ultra-small goethite nanoparticles E Brok, C Frandsen, DE Madsen, H Jacobsen, JO Birk, K Lefmann, ... Journal of Physics D: Applied Physics 47 (36), 365003 8 2014
Berhe, Asmeret Asefaw	How does sonication affect the mineral and organic constituents of soil aggregates?—A review M Kaiser, AA Berhe

	Journal of Plant Nutrition and Soil Science, DOI: 10.1002/jpln.2013003 7 2014
Berhe, Asmeret Asefaw	Impacts of organic matter amendments on carbon and nitrogen dynamics in grassland soils R Ryals, M Kaiser, MS Torn, AA Berhe, WL Silver Soil Biology and Biochemistry 22 2014
Berhe, Asmeret Asefaw	Erosion, deposition, and the persistence of soil organic matter: mechanistic considerations and problems with terminology AA Berhe, M Kleber Earth Surface Processes and Landforms 32 2013
Berhe, Asmeret Asefaw	Effectiveness of biochar for sorption of ammonium and phosphate from dairy effluent DV Sarkhot, TA Ghezzeehei, AA Berhe Journal of Environmental Quality 42 (5), 1545-1554 21 2013
Berhe, Asmeret Asefaw	A New Method for Rapid Determination of Carbohydrate and Total Carbon Concentrations using UV Spectrophotometry AA Albalasmeh, AA Berhe, TA Ghezzehei Carbohydrate Polymers 57 2013
Berhe, Asmeret Asefaw	Effect of litterbags on rate of organic substrate decomposition along soil depth and geomorphic gradients AA Berhe Journal of Soils and Sediments, 1-12 1 2013
Berhe, Asmeret Asefaw	Application of ultrasound to disperse soil aggregates of high mechanical stability M Kaiser, AA Berhe, M Sommer, M Kleber Journal of Plant Nutrition and Soil Science 14 2012
Berhe, Asmeret Asefaw	Persistence of soil organic matter in eroding versus depositional landform positions AA Berhe, JW Harden, MS Torn, M Kleber, SD Burton, J Harte Journal of Geophysical Research - Biogeosciences 117 (G02019, doi:10.1029 ... 42 2012
Berhe, Asmeret Asefaw	Erosion, deposition and replacement of soil organic carbon in Mediterranean catchments: a geomorphological, isotopic and land use change approach E Nadeu, AA Berhe, J de Vente, Boix-Fayos, C. Biogeosciences 9, 1099-1111 42 2012
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	DV Sarkhot, AA Berhe, TA Ghezzehei Journal of Environmental Quality 36 2012
Berhe, Asmeret Asefaw	Decomposition of organic substrates at eroding vs. depositional landform positions AA Berhe Plant and Soil 350, 261-280 28 2012
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Blois, Jessica	Modeling species and community responses to past, present, and future episodes of climatic and ecological change KC Maguire, D Nieto-Lugilde, MC Fitzpatrick, JW Williams, JL Blois Annual Review of Ecology, Evolution, and Systematics 46, 343-368 4 2015
Blois, Jessica	Close agreement between pollen-based and forest inventory-based models of vegetation turnover D Nieto-Lugilde, KC Maguire, JL Blois, JW Williams, MC Fitzpatrick Global Ecology and Biogeography 24 (8), 905-916 3 2015
Blois, Jessica	A 2.5-million-year perspective on coarse-filter strategies for conserving nature's stage JL Gill, JL Blois, B Benito, S Dobrowski, ML Hunter, JL McGuire Conservation Biology 29 (3), 640-648 4 2015
Blois, Jessica	Community ecology in a changing environment: Perspectives from the Quaternary ST Jackson, JL Blois Proceedings of the National Academy of Sciences 112 (16), 4915-4921 10 2015
Blois, Jessica	Monotypic species and extinction risk: looking at lagomorphs D DeNeve, J Nye, JL Blois Frontiers of Biogeography 7 (2) 1 2015
Blois, Jessica	A framework for evaluating the influence of climate, dispersal limitation, and biotic interactions using fossil pollen associations across the late Quaternary JL Blois, NJ Gotelli, AK Behrensmeyer, JT Faith, SK Lyons, JW Williams, ... Ecography 37 (11), 1095-1108 12 2014
Blois, Jessica	Climate refugia: joint inference from fossil records, species distribution models and phylogeography DG Gavin, MC Fitzpatrick, PF Gugger, KD Heath, F Rodríguez-Sánchez, ... New Phytologist 204 (1), 37-54 49 2014

Blois, Jessica	Model systems for a no-analog future: species associations and climates during the last deglaciation JW Williams, JL Blois, JL Gill, LM Gonzales, EC Grimm, A Ordonez, ... Annals of the New York Academy of Sciences 1297 (1), 29-43 8 2013
Blois, Jessica	Climate change and the past, present, and future of biotic interactions JL Blois, PL Zarnetske, MC Fitzpatrick, S Finnegan Science 341 (6145), 499-504 107 2013
Blois, Jessica	Space can substitute for time in predicting climate-change effects on biodiversity JL Blois, JW Williams, MC Fitzpatrick, ST Jackson, S Ferrier Proceedings of the National Academy of Sciences 110 (23), 9374-9379 73 2013
Blois, Jessica	Modeling the climatic drivers of spatial patterns in vegetation composition since the Last Glacial Maximum JL Blois, JW Williams, MC Fitzpatrick, S Ferrier, SD Veloz, F He, Z Liu, ... Ecography 36 (4), 460-473 24 2013
Blois, Jessica	Narrowing the estimates of species migration rates JL Blois Frontiers of Biogeography 5 (3) 2013
Blois, Jessica	From card catalogs to computers: databases in vertebrate paleontology MD Uhen, AD Barnosky, B Bills, J Blois, MT Carrano, MA Carrasco, ... Journal of Vertebrate Paleontology 33 (1), 13-28 17 2013
Blois, Jessica	Paleoecological changes at Lake Cuitzeo were not consistent with an extraterrestrial impact JL Gill, JL Blois, S Goring, JR Marlon, PJ Bartlein, K Nicoll, AC Scott, ... Proceedings of the National Academy of Sciences 109 (34), E2243-E2243 3 2012
Blois, Jessica	Deposition times in the northeastern United States during the Holocene: establishing valid priors for Bayesian age models S Goring, JW Williams, JL Blois, ST Jackson, CJ Paciorek, RK Booth, ... Quaternary Science Reviews 48, 54-60 22 2012
Blois, Jessica	Global climate evolution during the last deglaciation PU Clark, JD Shakun, PA Baker, PJ Bartlein, S Brewer, E Brook, ... Proceedings of the National Academy of Sciences 109 (19), E1134-E1142 110 2012
Blois, Jessica	No-analog climates and shifting realized niches during the late quaternary: implications for 21st-century predictions by species distribution models SD Veloz, JW Williams, JL Blois, F He, B Otto-Bliesner, Z Liu

	Global Change Biology 18 (5), 1698-1713 87 2012
Blois, Jessica	update: Recent advances in using species distributional models to understand past distributions JL Blois Frontiers of Biogeography 3 (4) 2 2012
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Winston, Roland	Precise measurements of direct CP violation, CPT symmetry, and other parameters in the neutral kaon system E. Abouzaid · M. Arenton · A. R. Barker · M. Barrio · L. Bellantoni · E. Blucher · G. J. Bock · C. Bown · E. Cheu · R. Coleman · [...] · J. Wang · H. B. White · J. Whitmore · M. J. Wilking · B. Winstein · R. Winston · E. T. Worcester · T. Yamanaka · E. D. Zimmerman · R. F. Zukanovich · May 2011 · Physical review D: Particles and fields
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University of California, Merced
Sierra Nevada Research Institute
Annual Report
July 2010 – June 2011

Roger Bales, SNRI Director

Eric Berlow, Yosemite Field Station Director

Liying Zhao, Environmental Analytical Laboratory Director

Armando Quintero, Director of Development

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Cover photo: The NSF-supported Southern Sierra Critical Zone Observatory, co-located with the USFS Kings River Experimental Watersheds, is a hub for research involving five SNRI faculty and their research groups, plus collaborators from eight other institutions. The research is carried out in partnership with the USFS Pacific Southwest Research Station and Sierra National Forest.

Background

The mission of the Sierra Nevada Research Institute (SNRI) at UC Merced is to discover and disseminate new knowledge that contributes to sustaining natural resources and promoting social well being in the Sierra Nevada-Central Valley region, and related regions worldwide. SNRI accomplishes its mission by:

- Fostering interdisciplinary research that focuses on the Sierra Nevada eco-region, including the Central Valley and other adjacent areas.
- Facilitating synergistic links between science, the arts, education and natural resource management

SNRI was part of the original 1997 Academic Plan for the UC Merced campus, and UC Merced's first partnership with resource managers, Yosemite and Sequoia-Kings Canyon National Parks, were formed that same year. The founding Director of SNRI (S. Traina) joined UC Merced in 2001; additional faculty and research scientists joined SNRI in 2003. R. Bales became SNRI Acting Director in 2007 and Director in 2008. SNRI has maintained its inaugural focus and the regional identity envisioned in its original prospectus. In 2007 SNRI became UC Merced's first, and still only, UC Organized Research Unit (ORU). SNRI adopted bylaws in May 2008.

Membership

During academic year 2009-10, 27 UC Merced faculty were members of SNRI, and 26 research scientists affiliated with SNRI. The faculty have affiliations in the three Schools, and with seven of UC Merced's nine graduate groups and programs. Faculty members for 2009-10 were:

Andreas Aguilar	Michael Dawson	Stephen Hart	Wolfgang Rogge
David Ardell	Benoit Dayrat	Kathleen Hull	Samuel Traina
Roger Bales	Henry Forman	Robert Innes	Anthony Westerling
Asmeret Berhe	Carolin Frank	Lara Kueppers	Roland Winston
Elliott Campbell	Teamrat Ghezzehei	Teenie Matlock	Jeff Wright
Yihsu Chen	Qinghua Guo	Valerie Lepppert	
Martha Conklin	Tom Harmon	Peggy O'Day	

The SNRI advisory committee, appointed by the Executive Vice Chancellor, consisted of S. Hart (chair), A. Westerling, K. Hull, T. Harmon, H. Forman and one outside member, D. Graber (National Park Service).

Research highlights

SNRI faculty and researchers published over 70 papers and at least one book in 2009-10; and nearly 60 graduate students were working with SNRI faculty. Some highlights of work published during the 2009-10 academic year follow. Note that SNRI faculty and researchers have projects and publications focused within the Sierra Nevada and surrounding valleys and in other areas.

- Steve Hart and colleagues investigated the relationship between carbon and nitrogen availability and the stable carbon and nitrogen isotope composition of soil microbial biomass across a three million year old semiarid substrate age gradient; finding that N-15, but not C-13 enrichment of soil microbial biomass reflects changes in C and N availability and N processing during long-term ecosystem development. (*Soil Biology & Biochemistry*, Aug 2009).
- Elliott Campbell and colleagues evaluated the potential for producing native C-4 grasses for cellulosic ethanol and bioelectricity on abandoned agricultural land in Kentucky, and found that this approach could account for up to 13.3% and 17.2% of the state's 2 trillion MJ energy consumption and reduce green house gas emissions by 68% relative to gasoline. (*Global Change Biology Bioenergy*, Aug 2009).
- Peggy O'Day and colleagues investigated geochemical versus hydrologic controls on the mobilization of arsenic derived from past herbicide applications, and found the arsenic to be geochemically labile,

with the aquifer sediments having limited capacity for arsenic sorption. Hydrologic controls were thought to dominate arsenic transport. (*Applied Geochemistry*, Nov 2009).

- Robert Innes analyzed industrial economic data and determined that environmental innovation is an important driver of reductions in U.S. toxic emissions; and that tightened pollution targets induce environmental innovation. His results also indicate that the "environmental policy multiplier" - the proportionate contribution of induced innovation to long-run emission reduction - is small (*Journal of Environmental Economics and Management*, Jan 2010).
- Henry Forman reported that physiological signaling by reactive oxygen species, emerging as a major process, relies on oxidation of thiols by hydrogen peroxide. However, enzymatic reactions are required to make reactions sufficiently rapid for signaling. (*Biochemistry*, Feb 2010).
- Elliott Campbell found that in the Southern Appalachian forest region, life-cycle emissions of coal production for MCM methods were found to be quite significant when considering the potential terrestrial source. Including terrestrial disturbance in coal life-cycle assessment indicates that indirect emissions are at least 7 and 70% of power plant emissions for conventional and CO2 capture and sequestration power plants, respectively. (*Environmental Science & Technology*, Mar 2010).
- Tony Westerling and colleagues analysis of wildfire area burned in the Western U.S. indicates that the mechanism behind the observed wildfire-climate relationships is climatic preconditioning of large areas of low fuel moisture by drying of existing fuels or fuel production and drying; this implies that impacts of climate change on wildfire regimes will therefore vary with the relative energy or water limitations of ecosystems. Data also indicate that for 1977-2003, despite possible influence of wildfire suppression, exclusion, and fuel treatment, area burned is still substantially controlled by climate. (*Ecological Applications*, Jul 2009).
- Roger Bales and Bob Rice evaluated the design of embedded sensor networks for measuring snow depth at the scale of 1-16 km^2 in the Sierra Nevada. Results of 4 years of measurements show that a relatively compact 0.4 ha instrument cluster, deployed to capture the physiographic variability in a catchment, can represent spatial patterns of snow depth. (*Water Resources Research*, Mar 2010).
- Qinghua Guo developed improved approaches for developing digital elevation model information from lidar (Light Detection and Ranging) data, illustrating the tradeoffs between efficiency and accuracy in complex terrain. (*Photogrammetric Engineering and Remote Sensing*, Jun 2010).
- Steve Hart and colleagues showed that in a Ponderosa Pine forest, although total ecosystem carbon was 42% lower at an intensely burned site (10 years after burning) than at an undisturbed site, the burned site was a net annual source of carbon to the atmosphere whereas the undisturbed site was a sink. Net primary production, evapotranspiration, and water use efficiency were lower at the burned versus undisturbed site. Thinning of the undisturbed site decreased total ecosystem carbon by 18%, decreased evapotranspiration, did not change water use efficiency, and changed the site from a carbon sink to a source in the first post-treatment year. (*Ecological Applications*, Apr 2010).
- Roger Bales and colleagues evaluated temporal changes in accumulation over the Greenland ice sheet, using a model of sufficient resolution to allow calibration with the many ice cores that the group has developed in recent years. Results showed recent enhanced accumulation in the southeast, of sufficient magnitude to affect ice-sheet-wide mass balance. (*J. Geophys. Res.-Earth Surf.*, Apr 2010).
- Kathleen Hull reported on demographic decline of the Yosemite Indian population during the colonial era, placing these data in the context of a 5500-year profile of human demographic change derived using archaeological proxy measures. Data also suggest even more severe demographic decline due to prolonged droughts of the Medieval Climatic Anomaly. (*Pestilence and Persistence*, UC Press, 2009).

Grants

SNRI faculty and researchers continue to be very productive in obtaining grants, largely from federal and state agencies. Averaged over a four-year period, awards to SNRI faculty amounted to 41% of total campus research awards. Several of the research projects are collaborative with colleagues from other

campuses and government research organizations, significantly expanding the impact of SNRI. Following is a summary of awards by year.

Item	Amunt per FY, mission dollars				Percent of total			
	07-08	08-09	09-10	10-11	07-08	08-09	09-10	10-11
Extramural grants	16.4	14.2	21.9	17.4	–	–	–	–
Research grants	11.3	14.0	19.7	15.0	100	100	100	100
Research grants to SNRI faculty[a]	6.2	3.5	7.2[a]	6.8	55	25	37[a]	46

[a]Does not include $2.25 million award to R. Winston for California Solar Technology Institute (48% of research grants with that award)

Yosemite Field Station at Wawona

The mission of the SNRI Yosemite Field Station (YFS) is to facilitate synergistic links among science, education, resource management, and the arts. YFS is dedicated to the idea that it is the interconnections among different programs and researchers that makes an "institute" more than the sum of it's parts. To achieve this mission, the SNRI Yosemite Field Station provides logistical support (office space, internet access, lab and classroom space, and housing) for research, education, and collaborative workshops inside Yosemite National Park (YNP). It also provides programmatic support by acting as a liaison between the university and the science and education divisions of Yosemite. But most importantly, the YFS career manager plays an active role in connecting the dots among people and programs to create opportunities for synergies and collaborations. Housing is also consciously equipped to enable social gatherings that facilitae interaction among station users scattered in different houses. Without this engagement, we would just be a collection of individuals and programs working in isolation and too busy to talk to one another.

The SNRI Yosemite Field Station functionally opened its doors in March 2006 with the arrival of its first Station Manager. It is now a vibrant learning community with a critical mass of students (high school, undergraduate, and graduate), researchers, professors, and artists. It has also transformed the sleepy village of Wawona with an infusion of young, creative energy. In summer the station regularly houses over 40 high school, college, and recently graduated students in full-time residence.

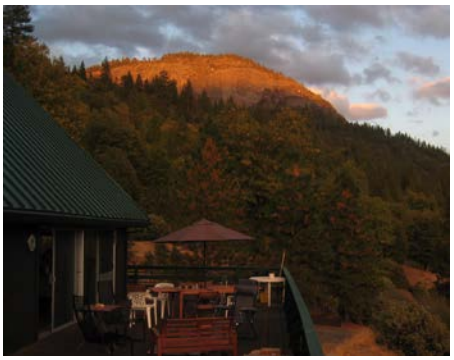
These developments have had an important impact on the success of UC Merced. The partnership with Yosemite is critical for developing UC Merced's unique image and standing in the entire UC system. As a new campus, UC Merced cannot 'compete' with other UC campuses, it must be unique. The partnership with Yosemite National Park is just that. The YFS is the first concrete, tangible manifestation of the official partnership and MOU with Yosemite. It has transformed a polite handshake (i.e., MOU) into tangible programs that impact real people and produce real products for both the campus and the park. Many students matriculating to UC Merced now express that the unique programs at YFS played an important role in their decision to choose this campus. YFS has also increased UC Merced's visibility in the UC System as the highest profile new reserves in the UC Natural Reserve System (see NRS *Transect* article profiling YRS). Not only is YFS helping put UC Merced on the national map, but it has already left a profound mark on the history book of Yosemite itself. The Yosemite Conservancy has gone from skeptical giving to support UCM to now highlighting YFS programs as the flagship of their "Youth in Yosemite" project in their official magazine. NPS top administration in Washington DC is turning to YFS as a national model for University-NPS partnerships for transforming and rigorously engaging youth. In all these cases, it is the synergies among programs that are providing examples that captivate the imagination of what is possible. UC Merced and Adventure Risk Challenge high school students are now featured speakers at fund raising events from the Yosemite Conservancy to the Southeast Asian-American Professional Association.

YFS is formally the main node in the Sierra Nevada Natural Reserve, which although administered through SNRI has formal reporting to the UCM Vice Chancellor for Research. The SNRI Director

continues to serve as the faculty manager for the Sierra Nevada Natural Reserve, though in the future these functions could be split.

Staffing. As part of being designated a part of the UC Natural Reserve System, the UCM Chancellor affirmed in writing long-term staff funding to manage and operate the SNRI Yosemite Field Station. Current positions include:

- *Field Station Manager* – 0.75 FTE (Step II Project Scientist). The position was approved at 1.0 FTE by the chancellor in March 2009, however 0.25 FTE was leveraged to increase the Facilities Maintenance Coordinator position from 0.50 FTE to 1.0 FTE (see below). Duties of the station manager include: 1) overseeing field station operations; 2) serving as a liaison between UC Merced and Yosemite National Park; 3) facilitating research by students, researchers, and faculty in Yosemite and Sequoia-Kings Canyon National Parks, and encouraging science that addresses knowledge gaps and priority needs in the parks and the region; 4) engaging with national park and USGS science staff to facilitate mutually beneficial collaborative research relationships with SNRI; 5) facilitating UC Merced education and outreach collaborations and partnerships with Yosemite; and 6) conducting research under the auspices of the SNRI.



With its large deck and sweeping vistas, the Landsnaes House serves as a hub for visitors and events at the YFS.

- *Building Manager* –The building manager is based in Fresno and is responsible for overseeing maintenance, repairs, and renovation work on YFS structures. YFS buildings are a portion of a larger portfolio of buildings that are managed by this position, which reports to and is supported by Facilities Management on campus.
- *Facilities Maintenance Coordinator* – This position was increased from 0.5 FTE to 1.0 FTE in 2010 to accommodate the increase in facilities and in station use. This position resides in FM but is funded by SNRI. This position reports to the SNRI Building Manager in UC Merced's Fresno Center and is responsible for coordinating and/or performing periodic maintenance, basic repairs, and minor renovation on the facilities' structures, mechanical systems, equipment and furnishings. This position is also responsible for assuming the weekly custodial responsibilities for the facilities and overseeing the grounds. Together with the Field Station Director, the position is responsible for serving as an on-site point of contact for station users, anticipating user needs, responding to emergencies, assisting with reservations, scheduling, invoicing, and use tracking.
- *Administrative support* – The MSOs for the Office of Research and for SNRI, the SNRI administrative assistant, and SNRI faculty director provide support to the Field Station Manager for purchasing, budget reconciliation, station recharge tracking, planning and oversight..
- *Faculty Manager*. A UC Merced faculty member has formal responsibility for the YFS operation and programs. Reporting is to the Vive Chancellor for Research..

Facilities. The field station buildings are inside Yosemite National Park and belong to the National Park Service. They are managed by UC Merced under a special use permit, which requires that UCM maintain the structures and use them only for the research, education, and outreach purposes outlined in the permit. UCM is allowed to charge a nominal fee to help support the operations. SNRI facilities at Wawona include:

- Office building – This historic building (built in 1934) has office space for 8 people and additional temporary space for 2-3 more. It also houses a small laboratory space, and a communal kitchen. It was rehabilitated before being turned over to the UCM through a $170,000 Yosemite Fund grant.

- Classroom/meeting room – The western half of the detached garage was renovated to create a small class/meeting room space that can accommodate up to 20 people. A $410,000 NSF grant was awarded in fall 2010 to completely renovate this entire historic stable to expand the quantity and quality of additional work space and meeting space. As of July 2011, the designs are 100% complete and the project is going out to bid. We anticipate constructionto begin in September 2011 and be completed before the summer field season of 2012.
- Landsneas house (currently serves as Station Manager's residence) – 3 bedrooms, 3.5 bathrooms, 6 beds, phone and internet. When not used by the field station director, it is available to visiting researchers on the online reservation system.
- Vincent house – 2 bedrooms, 1 bathroom, 4 beds, phone and internet.
- Livingston house – 5 bedrooms, 3 bathrooms, 16 beds, phone and internet- NEW IN 2011 – this house now has seemless backup power for winter storm outages. Old furnaces replaced with high efficiency furnace. Also common room completely refurnished in 2011 thanks to an NRS facilities grant.
- Joyce house – 3 bedrooms, 2 bathrooms, 9 beds, phone and internet.
- Dull house – 3 bedrooms, 2 bathrooms, 9 beds, phone and internet. No heat - Summer use only.
- River Rd. cabin – 1 bedroom, 1 bathroom, 2 beds, phone and internet. Basement converted into a maintenance workshop and storage area.
- Bruce Rd. cabin – 1 bedroom cabin, 1 bathroom, 2 beds. No phone or internet. NEW IN 2011 – This cabin now has heat and can be used in winter.

add pic here from UCM YLP student Alex Yin – i have put in an inquiry for photos from him

Part of a Friday science seminar at the YFS in Wawona, for undergraduate students in the Yosemite Leadership and Research Experience for Undergraduates Programs.

Total housing capacity of SNRI YFS is 42, not including the Station Director's residence. YFS frequently leverages other resources in the Wawona community:

- Boyer house – Managed by Yosemite Conservancy. 2 bedrooms, 1 bath, 4 beds. YC has generously allowed us to use this house for students participating in the Yosemite Leadership Program summer internship.
- Wawona Elementary School – The school has generously allowed us to use the entire school and to set up a tent camp behind the school to support our main high school summer program - the Adventure Risk Challenge English literacy and leadership training for 10-12 underserved Merced County students.
- Wawona Community Center can accommodate meetings of up to about 80 people.
- Wawona Hotel Sunroom can accommodate meetings of up to about 75 people and has generously been donated by DNC for use in our annual open house.
- Wawona Hotel Restaurant has generously supported our annual open house by catering the event
- Heidi's Catering is a local, excellent caterer available for visiting groups to host dinners in YFS housing.

The main facilities Improvements for 2010-11 were made possible by a $20,000 grant from the UC Natural Reserve system to add heat to the Bruce Cabin, replace old and unreliable furnaces in the LIvingston house, add backup power to Livingston, furnish the Livingston common room, and repair decks that were damaged in winter storms.. Eric Berlow and co-PIs were awarded a $410,000 NSF grant through the Academic Research Infrastructure program to renovate the historic stable adjacent to the office building and convert it into high quality research space. Construction is anticipated to be complete before the summer 2012 field season.

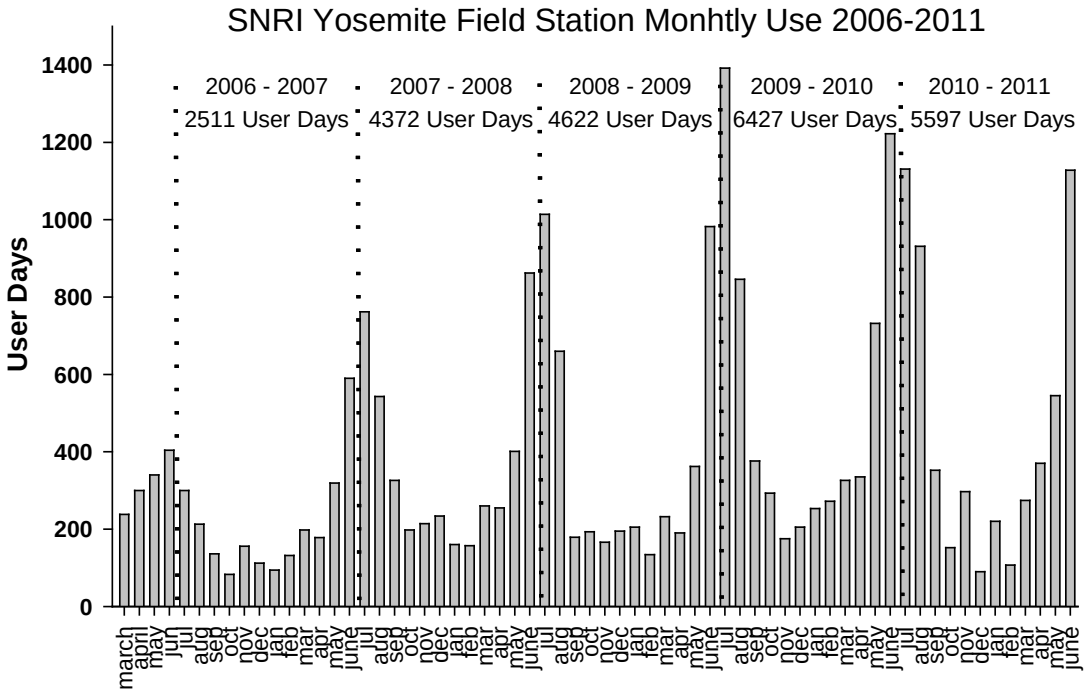


Figure 1. Total YFS user days per month. Vertical dotted lines indicate the start of each fiscal year.

Station use. Annual Station use in 2010-11 was slightly lower than the previous year, in part due to an unusually stormy winter and cold spring that resulted in Yosemite's snowpack being up to 300% of the long-term average in some parts of the park. Many group trips had to be cancelled and many researchers had to postpone fieldwork into July. We also switched our system for tracking use and did not track well temporary day use (groups or individuals that used the facility but did not spend the night). Thus, after 3 years of rapid growth in response to increased housing, YFS annual use is leveling off at approximately 6000 user days. The station is now consistently operating at maximum capacity in summer. The main room for growth now is in the shoulder seasons and in winter. Most of this use comes from weekend field trips and workshops. But there is generally no long term use in winter.

In FY 2009-2010, SNRI YFS was used by researchers, students, and other professionals from a wide variety of organizations and institutions. The primary categories of use were research, education, and academic or lab retreats/workshops.

Institutions and Organizations that used YFS in 2010-2011

Universities

UC Merced
UC Berkeley
UC Davis
UC Santa Cruz
UC Santa Barbara
San Francisco State Univ.
Stanford University
Naval War College, Monterey CA
York University, Toronto, Canada
Universidad Católica, Santiago, Chile

Public agencies

Merced Union High School District
US Geological Survey
US Forest Service
National Park Service
California Department of Water Resources
Lawrence Berkeley National Laboratory

Organizations

National Center for Ecological Analysis & Synthesis
Microsoft Research
Yosemite Conservancy
Pacific Ecoinformatics & Computational Ecology Lab
Dandelion Dance Theatre Co.
Skoll Global Threats Fund

Educational programs. While the Yosemite Field Station was originally intended to be primarily a physical space that facilitates investigator-initiated projects or class field trips, we have capitalized on opportunities to run multiple integrated programs that have now become a flagship for UC Merced's unique and creative contribution to Yosemite and to underserved populations of the Central Valley. Each program has an individual identity, but the key to success has been the added value of synergistic interactions among them. The broader vision for these educational programs is an integrated, intergenerational youth leadership program that creates a pipeline of students at different stages from early high school to recent graduates and graduate students. These programs have been highlighted in various media outlets:

add alex lin pics

Yosemite Leadership Program students dusring their summer work in the Park.

- Fresno Bee, http://www.fresnobee.com/2011/08/10/2495309_p2/students-take-on-rigorous-40-day.html
- UCM feature on YLP http://www.ucmerced.edu/featuredetail.asp?featureid=656
- Local newspaper in Pennsylvania: http://www.southernchestercountyweeklies.com/articles/2010/10/20/avon_grove_sun/news/doc4cbf1d44307b2696378848.txt
- Delaware North Companies – Sentinel newsletter
- Yosemite NP website http://www.nps.gov/yose/naturescience/meadows.htm
- ARC was among the 20 success stories to be highlighted in the official *International Year of Biodiversity Countdown 2010* publication. We were the only North American organization highlighted in the document http://www.countdown2010.net/files/MADE_IN_C2010.pdf
- UC Natural Reserve System: fall 2010 Transect http://nrs.ucop.edu/media/transect/pdf/TR28-1.pdf
- NPS Videos: http://www.youtube.com/watch?v=0AEXtDNH_4M

High School programs in AY 2009-10 include:

- *Adventure, Risk, Challenge (ARC)* – ARC is a year-round educational outreach program that partners UCM and Yosemite with public high schools and underserved communities of the Central Valley to engage English language learner (ELL) high school students. A 6-week immersion summer course at the SNRI YFS integrates a rigorous curriculum of outdoor education, leadership training, English literacy, and science. ARC addresses the needs of underserved ELL students and enables them to be successful high school students, highly competitive college applicants, and ultimately our next leaders. The program continues with outreach throughout the academic year, both at the schools and also through monthly weekend workshops at YFS. Explicit program integration with the UC Merced Yosemite Leadership Program students stimulates ARC students' interest in going to college, and UC Merced in particular. After attending ARC, 92% of the students pass the English language arts portion of the high school exit exam, compared to 40% of English language learners state-wide.
- *Robert Fore Fellowship (Merced Union High School District, MUHSD)* – This program is provides training workshops in Yosemite for 16 high school science teachers in the MUHSD. The teachers learn about ongoing research by SNRI, USGS, and Yosemite National Park researches. They discuss issues at the interface of science and conservation, and share ideas about how to incorporate new material into their lesson plans.

Undergraduate programs in AY 2009-10 included:

- *Yosemite Leadership Program (YLP) undergraduate summer internship* – This program provides UC Merced undergraduates with diverse internship opportunities in Yosemite that range from serving as

bilingual interpretive rangers, to working on meadow restoration crews, to saving lives as part of the Yosemite Search and Rescue team, to creating a greenhouse gas emissions inventory for the Delaware North Companies (DNC) operations. Not only does this program provide an incredible diversity of opportunities, but it has also been enormously successful at catalyzing stronger relationships between UC Merced, YNP, DNC, and the Yosemite Conservancy (YC). Both the ARC and YLP programs were embraced by both YNP and YC as flagship youth programs in the park. The YLP internship in Yosemite fulfills one requirement of the 2-year extracurricular environmental leadership certificate program on campus. All students participate in a 2 credit Environmental Leadership Seminar (see below) where they complete an independent project that contributes something unique to the park branch or organization in which they are working. This project then serves as a seed for the 'capstone legacy project' required for their environmental leadership certificate. In 2011 this program expanded to Sequoia-Kings

Research Experience for Undergraduates (REU) Program – Funded by the National Science Foundation, this program complements the YLP non-science internships by providing opportunities for undergraduates to conduct independent research projects at the interface of science and natural resource management. Most of the students are co-mentored by a UCM professor and a member of their research group; a park or USGS scientist is also involved in ost projects. REU student projects are serving as a catalyst for collaborative research between UCM and the park. The grant supporting this program ended in August 2010 and it is a priority to submit a renewal proposal to continue the program in future years.

- *Environmental Leadership Seminar* – Both YLP and REU students enroll in this 2-credit summer seminar. This seminar includes: 1) weekly lectures by inspiring people who represent diverse leadership roles and styles, 2) weekly workshops that engage students to explore leadership issues specific to environmental issues, and 3) independent projects that lead to a final public presentation at a SNRI Student Symposium in Yosemite Valley.

Two graduate educational programs were hosted at the YFS:

- *SNRI Scientific Visualization Fellowshi*p (*SciViz*) – This fellowship provides 3 months of housing at YFS and a $1500 stipend to support up to three artists interested collaborating with scientists or creatively communicating scientific information. In 2011 there were four SciViz Fellows: One scientific illustrator, a professional writer, a multi-media artist, and a digital media specialist. We have been in discussion with DNC to explore options for selling SciViz Fellow art in the hotel gift shops – in addition to supporting the artists, this would provide more exposure for SNRI programs in the park.
- *NRS Mathias Grant* – Three UC Merced graduate students were awarded a Mathias Grant to support their dissertation research in Yosemite: 1) Kaitlin Lubetkin (Lara Kueppers lab) on conifer encroachment of meadows, 2) Chelsea Arnold (Asmeret Behre lab) on meadow soil carbon storage, and 3) Alyssa Carrell (Carolin Frank lab) on conifer and meadow plant endosymbionts.

While each of the programs described above is outstanding in it's own right, it is the interactions and synergies among them that really stand out and have brought them to the attention of the media and donors. Some highlights are described in the following paragraphs.

Bilingual UC Merced YLP interns actively mentor ARC high school students on their writing during the summer, assist ARC instructors to tutor ARC students at their high school during the academic year, and host ARC students for visits to the UC Merced campus . In the process, going to college becomes a tangible dream for ARC students, and it motivates them to improve their language and writing skills to become highly competitive college applicants. At the same time, YLP students are thrown into true leadership roles as they give back tangibly to their community. Some YLP students have led ARC students on outdoor adventure trips as part of their 'capstone legacy project' – in the process YLP students are trained by ARC instructors on outdoor risk management for leading high school student groups. A number of YLP students express that their life path has been transformed by their experience

mentoring ARC students, and each year, one YLP student returns as a teaching assistant for the summer ARC immersion course.

Scientific Visualization Fellows work with YLP, REU, and Ph.D. students to encourage them to communicate creatively about their work. This includes working with the students on scientific illustrations, video production, graphic design, writing, presentation slide layout, etc.

Research. Several research projects used the Yosemite Field Station as a base for part or all of their work in 2010-11, including the following:

- Sierra Nevada Adaptive Management Project (SNAMP) – a long-term collaborative project among UC Merced, UC Berkeley, UC Davis and the US Forest Service to evaluate the ecological and environmental impacts of fire control thinning practices. SNAMP researchers spent the winter at YFS tracking and photo-trapping American Fisher.
- Sierra Nevada Hydrologic Observatory – a Sierra-wide, UC Merced SNRI-led initiative to improve understanding of the hydrological dynamics that determine much of the water supply for California.
- Effects of Prescribed Fire on Spotted Owls – A USGS project to understand how management fires in Yosemite influence the food base and breeding success of the endangered California spotted owl.
- Climate Change and Amphibian Decline – A growing collaboration among UC Merced , YNP, and USGS scientists to understand the relative importance of climate and other impacts to Yosemite toads (*Bufo canorus*), a California species of Special Concern.
- Natural Resources Condition Assessment for Sequoia-Kings Canyon National Parks – USGS and UC Merced scientists based at YFS are contributing to this ambitious interdisciplinary effort to evaluate the state of knowledge for SEKI natural resources.
- Yosemite Invertebrate Biodiversity – This work by UCM Assistant Professor Benoit Dayrat uses DNA 'Barcoding' techniques to help quantify and characterize for the first time the broad scale patterns of aquatic invertebrate biodiversity in Yosemite.
- Alpine Lake Microbial Ecology and Biogeochemistry – UCM Assistant Professor Mike Beman is exploring how air pollution from the Central Valley is impacting alpine lake ecosystems.

The following individual graduate student research activities were carried out in Yosemite in 2010-2011:

- Lara Kueppers – Ph.D. student Kaitlin Lubetkin is investigating conifer encroachment of subalpine meadows.
- Steve Hart – Graduate Student Steven Lee is investigating early warning signs of catastrophic shift to meadow plant communities in response to anthropogenic and environmental stress.
- Carolin Frank – Ph.D. student Alyssa Carrell is investigating endosymbiotic microbes associated with conifers that are encroaching meadows
- Asmeret Behre, Teamrat Gezehi , and Anthony Westerling – Ph.D. student Chelsea Arnold is investigating the effects of summer climate and packstock use on carbon storage and cycling in subalpine and alpine meadows.
- Benoit Dayrat – Is investigating aquatic invertebrate biodiversity as indicators of Yosemite Toad breeding pool quality
- Andy Aguilar –Andy recently received funding in collaboration with USGS scientists to investigate population genetics of Yosemite Toad (Bufo canorus) populations in Yosemite and Sequoia-Kings Canyon National parks.

Outreach. Multiple activities took place in the outreach area:

- UCM Admissions: The Yosemite Field Station and YLP interns are used as 'poster children' for UCM to illustrate the unique educational opportunities available at UCM. YFS programs and the partnership with Yosemite are commonly cited as a critical factor in why many students chose to go to UC Merced.
- UC AGEP, LEADS, and BA STAR Programs – UC Alliance for Graduate Education and the Professorate, and the Basic and Advanced Science and Technology Academics of Research programs are using the SNRI Yosemite Field Station as part of their summer program to increase the

recruitment of minority students into graduate programs in science. UC Merced YLP interns lead these students on a tour, and YFS station director spoke with them about research in the park and research career options. This year we had students from both UC Merced and UC Davis programs

- UCM courses that used the SNRI Yosemite Field Station in 2010-2011: Snow Hydrology (Bob Rice), Ecology (Steve Hart), ESS 198 Science Fridays (Eric Berlow).
- Earthdance Environmental Film Festival – SNRI Yosemite Field Station facilitated a screening in Yosemite of this "Short-Attention-Span" Environmental Film Festival, curated by the Oakland Museum of California. http://earthdancefilms.com/
- YLP student projects have made significant outreach contributions to Yosemite including: 1) creating a bilingual podcast for Spanish speaking visitors, 2) creating educational videos for Half Dome trail hikers to reduce the number of annual casualties, 3) creating educational videos for park visitors to understand ecological restoration, 4) creating educational videos and fact sheets to education park visitors on Leave No Trace rules, 5) creating an incident map for the Half Dome trail that alerts hikers to hazards along the trail, 6) creating brochures to education park visitors about invasive plants and non-native fish, 7) serving as poster-kids for increasing diversity in the NPS workforce, 8) creating an interactive DVD for training future park interpretation staff on guiding tours of the Mariposa Grove, 9) creating a science journalism video explaining the frontiers of park research on the role of fire in carbon storage.
- Open House: YFS hosted the Yosemite community, Yosemite upper management, NPS top administration from Washington, UC Merced administrators (including the new chancellor), and past and potential donors for the annual SNRI YFS Open House at the Wawona Hotel. ARC and YLP students shared their experiences, and YFS station director presented an interdisciplinary science-art collaboration about research on yosemite meadows and threatened amphibians. The event was generously catered by Delaware North Companies.
- YFS continues to support YNP staff by managing UCM Affiliate Accounts for online access to the California Digital Library.

Healthy working relationships around mutually beneficial activities are an important component that SNRI helps to nurture. Some recent activities included:

- Improved UCM-Yosemite relations by developing collaborative student projects that address immediate high-priority park needs.
- Increased awareness on campus of SNRI research and education programs by organizing and hosting SNRI retreats, increasing the visibility of YLP student interns on campus, and regularly sending news/updates about SNRI programs to the UCM media department.
- Interacting with media outlets about YFS programs

Priority needs. The rapid increase in station housing capacity and station use in the past two years has created a vibrant interactive community at YFS during the peak season. However, the available functional workspace and meeting space has not kept pace with the demand. In addition to supporting the YFS programs and researchers, there is a strong interest in also providing some work space for YNP and USGS researchers to facilitate research collaborations that are at the core of SNRI's broader mission. To help meet this demand, we submitted and were awarded a National Science Foundation's Academic Research Infrastructure: Recovery and Reinvestment (NSF ARI-R²) grant to fully renovate the entire detached building into a year-round Informatics and Data Visualization Center. Completing these renovations before June 2012 is our top priority for facilities improvements this year.

There are two priority needs related to house improvements and deferred maintenance. First, the Dull House has no heat and thus limits our ability to accommodate large groups in the shoulder season. An estimate for adding heat to the Dull house is ~$10-15,000 Second, the deck of the Landsneas house is needs to be replaced. An estimate for this is ~$20-25,000. Given that the deck is used to host SNRI events, it's current state reflects extremely poorly on the quality of UC Merced, SNRI, and YFS.

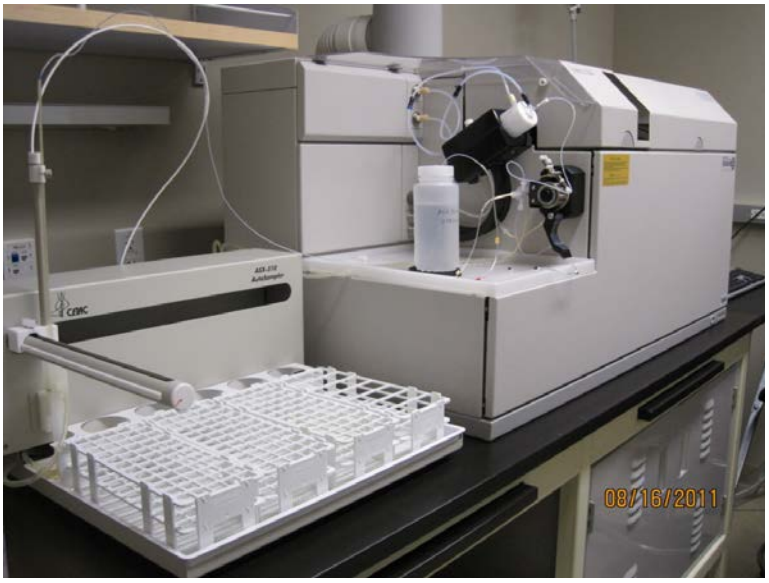
Sequoia Field Station at Wolverton

Lachat QuikChem 8500 Flow Injection Analysis System in SNRI's Environmental Analytical Laboratory

The SNRI presence at Wolverton, in Sequoia National Park, includes a small cabin with 3 bunks, leased from the Park, and a nearby workspace (former ski shop) that Delaware North Companies has made available for our research programs. This facility is under the same reservation system as is used for YFS, to enable managing it as another node in our field station program. Although use in 2010-11 was not tracked through this system, the calendar for the facilities shows that it was used most weeks in the summer half year, and at least twice a month in the winter half year. During 2010-11 3 faculty, 3 graduate students and one postdoctoral researcher affiliated with SNRI used it as a base for their research. Several outside collaborators also used the facility, including form UCLA and UC Berkeley.

Environmental Analytical Laboratory

Mission. SNRI is responsible for the operation and administration of the Environmental Analytical Laboratory (EAL), a campus-wide multi-user facility that serves essential analytical resources and plays a critical role in support of research and education programs in environmental, biological, Earth systems, and ecological sciences and engineering. It also serves campus users in other disciplines not closely related to SNRI. The mission of the EAL is to provide expertise in analytical applications and access to advanced instrumentation to facilitate research and education programs and foster inter- and multi-disciplinary collaboration among campus researchers. To achieve this mission, the EAL provides campus researchers with high quality, timely and affordable analytical service through its reliable, well-maintained research-grade instrumentation, established standard operating procedures (SOPs), comprehensive user training, online reservation, technical consultation, and dual recharge billing system. The facility supports self-operation instrument use, sample drop-off service, new project and grant proposal assistance and technical consultation. The purpose of the EAL core facility is to make expensive but frequently needed instrumentation available and affordable to campus researchers by employing a sustainable operation and management model in further support of research and education activities.



Closeup of.

Capabilities. The EAL is equipped with an array of state-of-the-art instrumentation and sample preparation equipment located at S&E I Room 201 (partial space) at UC Merced main campus. The EAL advanced instrumentation offers rapid and accurate measurements of major and trace elements, organic

and inorganic compounds to meet a wide range of analytical needs in support of diverse research and education programs in environmental, chemical, biological, the Earth systems, and ecological sciences and engineering. The following is a list of the major instruments and their capabilities:

The ICP-AE (right) and graphite furnace AA (left) are part of EALs capabilities for trace metal analyses.

1. *LGR DLT-100 Liquid-Water Isotope Analyzer.* DLT-100 Liquid-Water Isotope Analyzer uses tunable, off-axis integrated-cavity laser spectroscopy developed by Los Gatos Research, Inc. to measure hydrogen and oxygen isotopic composition ($\delta^{18}O$ and $\delta^{2}H$) in liquid water samples.
2. *Agilent 7500ce ICP-MS.* The Agilent 7500ce Inductively Coupled Plasma Mass Spectrometer is a high performance quadrupole mass spectrometer that offers ultra-low detection limit in ppt range and high sample throughout for multi-element analyses in solution samples. The system can be coupled to a liquid chromatography for speciation studies.
3. *Perkin-Elmer Optima 5300 DV ICP-OES.* The Perkin-Elmer Optima 5300dv is a dual view Inductively Coupled Plasma Optical Emission Spectrometer that offers detection limit in mid-ppb range and wide elemental capabilities. Its ease-of-use software and high sample throughout makes it a powerful tool for multi-element analyses in relatively high concentration samples.
4. *Perkin-Elmer AAnalyst 600 GF-AAS.* The Perkin-Elmer AAnalyst 600 Graphic Furnace Atomic Absorption Spectrometer with AS 800 Autosampler provides general use with major and trace element analyses.
5. *Varian Saturn 2200 Ion Trap GC-MS.* The Varian Saturn 2200 Ion Trap Mass Spectrometry coupled with CP 3800 Gas Chromatography is a bench top GC-MS that offers quantification and characterization for trace levels of low molecular organic compounds in environmental and biological samples.
6. *Shimadzu TOC-Vcsh Total Organic Carbon Analyzer.* The Shimadzu TOC-Vcsh system is a PC-controlled, high-sensitivity model used to measure dissolved carbon and nitrogen (with optional TNM-1 Total Nitrogen Measuring Unit) contents in liquid samples. Carbon contents in solid samples can also be analyzed with optional SSM-5000A Solid Sample Module.
7. *Lachat QuikChem 8500 Flow Injection Analyzer.* The Lachat QuikChem 8500 system uses reliable and accurate Flow Injection Analysis (FIA) technology and features high sample throughput and simple, rapid method changeover in determining ionic species from sub-ppb to percent concentrations. Our system includes 10 modules for measurement of low and high levels of ammonia, nitrate/nitrite, phosphate, silicate, and sulfate in a variety of sample matrices.
8. *Dionex ICS-2000 Ion Chromatographs (two sets, one is for anions and the other for cations***).** The Dionex ICS-2000 Reagent-Free Integrated Ion Chromatography System provides analytical capabilities for major anions and cations in a variety of sample types. Applications include anion analysis of F, Cl, , SO4, Br, NO3, PO4 and cation analysis of Li, Na, K, NH4, Mg, Ca.

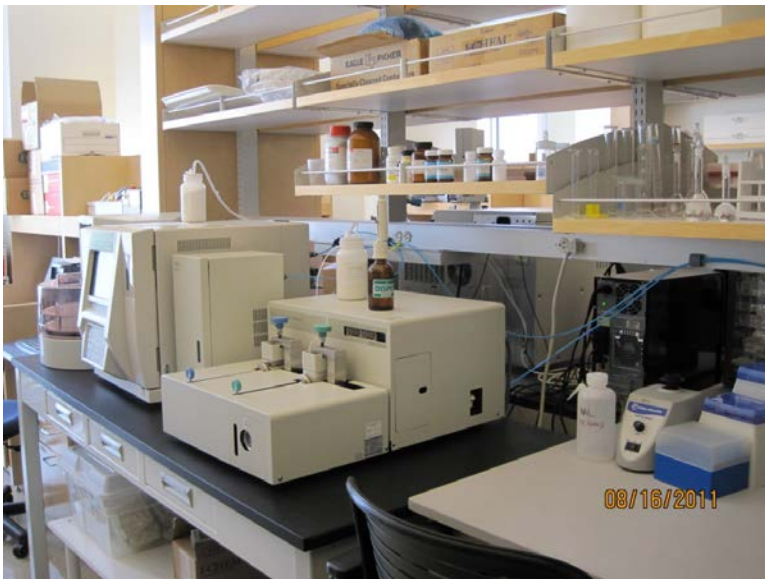
9. *LGR DLT-100 Liquid-Water Isotope Analyzer*. The DLT-100 Liquid-Water Isotope Analyzer version 2 provides an accurate measure of hydrogen and oxygen isotope ratios in liquid water samples. The system uses tunable, off-axis integrated-cavity laser spectroscopy developed by Los Gatos Research.

Additional sample preparation and separation devices include:

10. *Anton Paar Multiwave 3000.* The Multiwave 3000 is a versatile and powerful microwave sample preparation system that meets many sample preparation needs such as Drying, Evaporation, Acid Digestion, UV-Digestion, Oxygen Combustion, and Solvent Extraction.
11. *Millpore ELIX 10 and Mill-Q A10 Water Purification System* for high quality deionized water.
12. *Airclean 3000 Workstations* for ultra clean sample preparation**.**
13. *Other accessories* include analytical balance, oven, centrifuge, sample freezer & refrigerator, etc.

Facility operation. Year 2010-2011 marks the EALs second year of operation at UC Merced main campus, and also the second year on recharge. With improvements in operation, documentation, online reservation, and upgrades of lab hardware and software, the EAL this year became a fully functional core facility, with a streamlined and cost-efficient operation model. Great efforts have been taken to ensure that the facility operates to best serve our users with high quality, timely and affordable analytical service to meet their project needs and expectations. Procedures that have been employed to achieve this goal include:

- Instruments and laboratory equipment are tested and calibrated periodically
- Maintenance is conducted according to manufacturer guidelines and in accordance with the relevant standard operating procedures (SOPs) to optimize operating conditions to provide users with reliable, well-maintained instruments
- Inventories of consumables and relevant parts are updated and re-ordered frequently to avoid any unnecessary instrument downtime
- Software and hardware are updated when necessary.
- Laboratory method SOPs, instrument operation checklists and troubleshooting tips are well documented and reviewed periodically for updates
- New instrument applications and method developments are studied and introduced to benefit users with increased productivity and reduced costs
- User requests on technical assistance and project consultation are responded timely and informatively
- EAL staff provide very fast turnaround time for drop-off service.



Closeup of.

- Comprehensive training materials are prepared and synthesized for user training and offered to users year around with no charge

– Close attention and fellow-ups are practiced routinely to ensure best instrument performance and data quality while avoid unexpected instrument damage.

Recharge rates are posted online at http://snri.ucmerced.edu/snri/eal. Users have their choice of either a per hour or per sample rate. Drop-off services available for certain instruments offer users flexibility and convenience.

Facility use. The EAL user base has expanded over the past two years. More than 50 graduate, postdoctoral and undergraduate students have used the facility. A number of graduate students' thesis work relies on EAL instrumentation. In 2010-2011 facility use was similar to the previous year, withy use relying heavily on research funding and the varying stages of graduate student and postdoctoral projects. This year, five new graduate students and three new postdoctoral research scientists began their work using the EAL, and several frequent users from last year either graduated or moved on to new positions. The EAL recharge during the 2010-2011 fiscal year was about $29,000, versus $65,000 during the 2009-2010.

In addition to research use, EAL instrumentation supports undergraduate and graduate teaching. UCM courses that used EAL in 2010-2011 included ESS 170 (Soil Science Laboratory); ES 298 (Techniques in Soil Ecology); CHEM 115 (Instrumental Analysis and Bioanalytical Chemistry). A seminar course in Advanced Instrumental Analysis and an Environmental Mass Spectrometry course may be offered by EAL personnel as needed. This year, five undergraduate student research assistants participated in faculty research projects using EAL instrumentation.

Training, technical support andconsultation are provided to undergraduates, graduate students and postdoctoral researchers. As the only comprehensive resources that focus on analytical instrumentation and service at UC Merced, the EAL plays an important role in user training in support of research and teaching. Operated mainly in a self-operation mode, user training and follow-ups are crucial to ensure that instruments are operated and maintained properly, and that calibrations and samples are prepared correctly. Since users come from different fields with little or no analytical chemistry background, our hands-on instrument training and our training in analytical theory, including sampling protocols, sample preparation and storage, calibration and method selection, quality-assurance/quality-control protocols, provide users with critical knowledge and practical details to help ensure the data quality.

Closeup of.

Research and education activities. EAL is used in support of research by faculty, graduate students and research scientists, and in support of undergraduate education. Following are some research examples from 2010-11:

– In a study on application of ultrasound to investigate the mechanical stability of aggregates, the ICP-OES was used to determine Ca, Al, Fe, Mg, and Mn concentrations in aqueous media extracted from soil samples and TOC analyzer for measurement of dissolved organic carbon contents.

- A project using nutrient-enriched biochar for improving soil productivity and carbon sequestration was supported by three EAL instruments. Major cations and anions, organic carbon and nitrogen, as well as nitrate and ammonium concentrations were respectively measured using IC, TOC analyzer, and Flow Injection Analyzer.
- A research project aimed at developing remediation technologies for Hg contamination in natural systems used a number of instruments, including the ICP-MS, ICP-OES, TOC analyzer and multiwave digestion system. The work involved studying the effectiveness of amendments by measuring Hg and other major metal concentrations, and characterizing the chemical composition of the sediments/soils. Results thus far show success in application of cement amendments for reducing bioavailability of Hg in natural sediments by co- precipitating with secondary mineral phases from cements.
- A new project supported by DOE aimed at understanding molecular mechanisms and quantifying the kinetics of microbial anaerobic nitrate-dependent U(IV) and Fe(II) oxidation has begun to use a number of analytical tools, including ICP-MS located at EAL. By studying the biotic and abiotic mechanisms underlying the related processes, long-term effects of in situ reductive immobilization of uranium at a few DOE sites will be revealed.
- An NSF-funded project aimed at monitoring long-term changes of ultra-low ion species in Greenland surface snow and snow pits accounts for most use of IC. The funding also allows one undergraduate student researcher to work in the EAL for assistance in sample analysis.
- In addition, three researchers have benefited from a full analytical service provided by the EAL for identification and quantization of certain trace metal impurities in different complicated matrices using ICP-OES.

Facility management and development. All instruments were operated and maintained as scheduled, with no major repairs in 2010-2011. Minor hardware repairs, updates and additions included:

- The Millipore ELIX 10 Water Purification Pretreatment System was broken after 7 years' service. Extensive part replacements resumed it to working condition
- The DLT-100 Liquid-Water Isotope Analyzer was updated to its new version with improved accuracy and throughput.
- A few more modules for Lachat applications were added to expand its use.
- The EAL website was updated periodically to reflect new changes.

Technical support. The EAL continues to work with researchers by providing technical support to facilitate research and collaboration across campuss. Through in-depth knowledge and extensive skills in a broad variety of instruments, the EAL manager has been able to work effectively with diverse groups of students, postdoctoral researchers and faculty members to provide technical expertise and consultation in identification of appropriate analytical methods, preparation of method sections of a number of grant proposals, preparation of preliminary results for potential funding opportunities, and development and verification of a few new methods and applications.

Priority needs. The facility operation faces multiple challenges. As instruments become older more repairs are needed; we have no reserve for instrument repair or replacement. Meanwhile, costs of service contracts and consumables increase every year and recharge revenues fluctuate on a year-to-year basis, depending on the user base. Since recharge became effective in 2009, the revenue generated has helped offset costs for facility operation. The EAL needs to continue to expand its user base, and transition in part to operations supported by recharge, with base support for the full-time EAL manager..

National Parks Institute

The National Parks Institute is a collaborative venture of UC Merced and the National Park Service that provides management development curriculum for park and public land managers, promotes scientific research in parks, fosters stewardship, and promotes and develops environmentally sustainable

resource management practices. It was introduced by Congress in 2003 under legislation (HR 1289) sponsored by California congressmen George Radanovich (R-Mariposa) and Dennis Cardoza (D-Merced). SNRI faculty provide academic leadership for development of NPI programs.

In 2010 the second NPI Executive Leadership Seminar was offered, bringing together 30 national parks leaders from around the world for an intensive 11-day program designed to improve attendees' ability to anticipate change, innovate and manage strategically. The seminar began April 27 at the Institute of the Golden Gate in San Francisco, moved to UC Merced on May 3, and concluded with several days in Yosemite National Park. Several SNRI faculty led segments within the NPI seminar. The keynote speech was given on the UC Merced campus by Edward O. Wilson, Professor Emeritus, Harvard, University..

The Executive Leadership Seminar is now an annual event, with SNRI being the academic home for this and other NPI programs.

Planning and development.

A five-year SNRI business plan was prepared in 2010-11, and will be distributed in fall 2011. It provides a vision for development activities to support SNRI programs, and provides recommendations to transition much of the SNRI budget from general university funds to other revenue sources.

A strategic plan and a business plan for an over 6000-acre Campus Reserve Site to be used for research, education and conservation activities. Faculty from UC Merced and other campuses have contributed to the strategic plan. Launching of the Campus Reserve will involve hiring a manager/director and preparing an NRS proposal within the next year.

SNRI continued development of a field station in Sequoia-Kings Canyon National Park, and through agreements with the Park and the park concessionaire (Delaware North), make use of two buildings at Wolverton. This is also a target of development activity.

SNRI continues to plan for NSF's NEON investments in research infrastructure at the San Joaquin Experimental Range, Kings River Experimental Watersheds and other locations in the southern Sierra Nevada. Additional NSF investments are expected in the 2011-12 time frame.

SNRI's Development Director and the SNRI Director had a number of meetings over the year with potential donors and supporters of SNRI. These meetings included scheduled meetings of the UC Merced Foundation Trustees, Chancellor's Associates meetings, and 2-3 individual meetings per month.

The SNRI Director also worked closely with UC Merced's government relations staff to promote SNRI research and potential infrastructure investments with elected officials at the state and federal levels. The SNRI director also participated in frequent meetings with officials in multiple state and federal agencies around research and potential infrastructure investments in the SNRI region.

SNRI also supports multi-investigator proposals for research support, and made frequent use of the grant writer in UCM's Office of Research.

Operations and budget

SNRI staffing consists of an administrative assistant, management services officer, YFS director, YFS maintenance coordinator, EAL Director, Director of Development and SNRI Director. The Yosemite Field Station maintenance manager position has been upgraded from 0.5 to 1.0 FTE for the current year by reducing the commitment of the YFS director from 1.0 to 0.75 FTE. The EAL director was 0.5 FTE on university funds and 0.5 FTE on an NSF grant for initiating the laboratory through most of 2009-10. As that grant has now ended, it is expected that for 2010-11 the 0.5 FTE for the EAL director will be covered by carryover funds from 2009-10. SNRI employs a part-time undergraduate assistant, who works in both the EAL and the SNRI office. One development director (0.75 FTE) works on opportunities and priorities for SNRI.

The SNRI budget is growing through recharge, which will cover additional costs at the field stations and analytical laboratory. Note that this revenue source just became available in early 2009, coinciding

with field station and analytical laboratory resources becoming available for recharge. It is expected that recharge income will grow gradually over about a 5-year period, as demand for SNRI resources increases.

SNRI continues to be responsible for 8 vehicles, 7 of which are used on a recharge basis and one assigned to the Yosemite Field Station director. One of the recharge vehicles is assigned to the Critical Zone Observatory field hydrologist. The vehicles include:

2009 Subaru Forester: 100803	2007 Toyota Tacoma extended cab: 100706
2007 Honda Element: 100621	2007 Toyota Tacoma crew cab: 100709
2008 Nissan Xterra (CZO): 100801	2007 Nissan Frontier crew cab: 100708
2006 Honda Element (Wawona): 100619	2005 Chevrolet Silverado extended cab: 100504

Priorities for next year

Yosemite Field Station

- Complete upgrade of historic stable building and construction of laboratory space.
- Work out longer-term staffing plan, including addition of an educational coordinator.
- Explore options for larger meeting space, to help build up non-summer use of facility.

Sequoia Field Station at Wolverton

- Consolidate management functions and budget for existing facilities.
- Continue development activities to build up field station facilities and staffing.

Campus Reserve

- Complete business plan and initiate development activities to implement strategic vision.
- Hire Reserve Director and engage an SNRI faculty member to continue developing the reserve.

Environmental Analytical Laboratory

- Continue to grow facility capabilities, use and recharge income.
- Develop sustainable funding model involving a mix of recharge, indirect cost and state funds.

NEON-Southern Sierra Transect

- Continue NEON planning, in anticipation of infrastructure investments beginning in 2011-12.
- Expand development activities for research building for NEON and CZO at Dinkey Mill

San Joaquin Valley

- Initiate research activities aligned with the San Joaquin Restoration Project
- Continue working with partners to develop a long-term presence on valley rivers

Tulare basin

- Continue to work with Tulare Basin Wildlife Partners on program building
- Explore development opportunities for Tulare Basin research and long-term presence

SNRI on campus

- Expand development activities around graduate fellowships and research support
- Continue to explore opportunities for an SNRI building
- Develop a strategy for SNRI naming opportunity
- Continue to work with schools and graduate groups for strategic growth of UC Merced
- Strengthen collaboration among faculty, researchers, graduate students, and partners.
- Expand administrative support to better serve needs of SNRI faculty and research scientists

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University of California, Merced

Sierra Nevada Research Institute

Annual Report

July 2011—June 2012

The Sierra Nevada Research Institute (SNRI) at the University of California, Merced, was created to discover and share new knowledge that will help sustain the ecosystems of California and the world using integrated research in natural and social sciences and engineering.

SNRI's faculty, researchers and students have affiliations with each of UC Merced's schools and most of the campus's graduate groups. Concentrating on the Sierra Nevada eco-region, which includes the Central Valley and adjacent areas, SNRI aims to educate while also focusing some of the most important issues facing our society:

- climate and hydrology
- ecology and ecosystem science
- air pollution and public health
- resource management

Many of our research projects are created with the region's environmental and socio-economic issues as a context, an approach that results in breakthroughs and innovations that are regionally specific but globally applicable. In these and other ways, SNRI is transforming students' lives and making a significant impact on the world.

WELCOME

Thank you for reading SNRI's July 2011—June 2012 annual report. We focused this overview on what's new this year about the institute, and the affiliated faculty and staff who are contributing to new knowledge that contributes to the well-being of the Sierra Nevada and its surrounding valleys.

SNRI has expanded its research impact and outreach programs in Fiscal Year 2011-12 as our campus grew to more than 5,000 students. Faculty with expertise ranging from air quality to wildfire prediction to water resources collaborate with outside academic and resource management organizations across California and around the world, including the U.S. Forest Service, National Parks Service, and World Bank.

Our work in the past year has included increased focus on impacting public policy, and making more information available to inform decisions on adaptive management of our resources. For instance, data from the Southern Sierra Critical Zone Observatory is freely available online at czo.ucmerced.edu.

Recent efforts, in partnership with UC Center for Information Technology Research in the Interest of Society (CITRIS), have expanded a network of low-cost wireless sensors to monitor the American River basin's water availability.

The foundation for the Sierra Nevada Research Institute was laid in 1997, when SNRI was part of UC Merced's original academic plan and the campus's first partnerships with resource managers — Yosemite and Sequoia-Kings Canyon national parks — were formed. Sam Traina, SNRI's founding director, joined UC Merced in 2001, and additional faculty and research scientists joined SNRI in 2003.

As I assumed the leadership in 2007, SNRI became UC Merced's first organized research unit. SNRI faculty and researchers continue to be very productive in obtaining grants, largely from federal and state agencies, and several SNRI research projects are collaborative with colleagues from other campuses and government research organizations, significantly expanding the impact of SNRI. Nearly $17 million in total research grants — almost 40 percent of all research grants received by UC Merced — were awarded to SNRI faculty members in the past three years.

SNRI's facilities, faculty members and researchers have left their marks in other ways, as well, leading or cooperating in a number of research, educational and outreach programs. These include the university's growing National Parks Institute, which initiated an Executive Leadership Seminar in 2009 as a way to bring together national parks leaders from around the world to improve their ability to anticipate change, innovate and manage strategically.

UC Merced's outreach programs for middle and high school students prepare disadvantaged youth for college are supported by hosting a 40-day dynamic literacy program at our Yosemite Field Station. UC Merced students address park and public lands management issues through a two-year Yosemite Leadership Program, also hosted in Wawona.

While we use the Sierra and adjacent valleys of California for our primary focus, SNRI's researchers explored solutions to environmental and human problems around the world in the past year. We were increasingly active internationally in the past fiscal year, and this report reflects that growing world impact as well. Our research is highlighted in the center of this annual report.

Sincerely,

Roger Bales

Researchers Take Mountain Water Monitoring to the Next Level

Researchers at SNRI are taking an important step toward a statewide water-monitoring system to provide continuous information about how much water is available to users.

"Our research provides a template for the next-generation water information system for California," said UC Merced lecturer and researcher Robert Rice. "We will be able to accurately know the amount of snow across the Sierra Nevada, as well as the timing and magnitude of snowmelt, which provides our water."

"A modern, accurate water-information system is critical for water security, especially given the changes brought about by climate warming in the mountains." - Roger Bales

With low-cost sensors installed across the American River basin, scientists, water managers, farmers, flood-control managers and others will be able to get a more detailed picture of the amount of water in the basin.

"We're going from monitoring a 5-square-kilometer area to a 2,000-square-kilometer area in one big jump," said engineering Professor Martha Conklin. "It's a full-basin hydrologic observatory, and a prototype water information system."

COMMUNITY SERVICE

Research at Environmental Analytical Laboratory is Universal

Even though most people will never see what's going on in the Environmental Analytical Laboratory (EAL), many will be affected by the work that's performed there.

UC Merced's EAL, in the Science and Engineering Building, is home to a number of the university's researchers, who are looking into everything from local water quality to global climate change.

In some cases, the work is very local—one researcher analyze from a Merced resident's well, reporting that while some impurities in the well were above background, it still met water-quality standards.

And in some cases, the work is extremely global. One project provides long-term measurements of the Artic atmosphere, precipitation and snow/ice on the Greenland ice sheet to monitor and better understand climate change, as part of a long-term global sampling network.

But those are just a few of the EAL's functions. More than 20 research projects funded by federal, state and grants have been conducted using the EAL. Those projects have trained more than 80 graduate and undergraduate students, postdoctoral researchers and others in using multiple tools

Federal and state agencies, hydropower interests, irrigation districts and groups responsible for flood management and other water stakeholders are eagerly awaiting the stream of information that will result. Data is currently available online through the Department of Water Resources' California Data Exchange Center website.

The data will be public, so "the American River hydrologic observatory will be a place for the scientific community to work," Rice said.

The project is also part of the Intelligent Water Infrastructure initiative at the Center for Information Technology Research in the Interest of Society (CITRIS), a collaboration between UC campuses in Merced, Berkeley, Santa Cruz and Davis.

to achieve their research goals.

Researchers, graduate students and undergraduate students are working on projects that include ways to improve agricultural soil and reduce contaminants; remediation of sites contaminated by uranium and mercury; methods to reduce biomass from agricultural and forest lands and dispose of excess nutrients from dairy manure; better management of carbon flows through ecosystems—work that's critical in mitigating the effects climate change; medical research into issues like cystic fibrosis; and much more.

New Report Shows Modest Improvements in Central Valley Environmental Health

Five years have seen some steps forward in the environmental well-being of the 450 mile-long Central Valley of California. The Sierra Nevada Research Institute at the University of California Merced and The Great Valley Center jointly produced "The State of the Great Central Valley: Assessing the Region Via Indicators—The Environment 2006-2011."

There has been a modest improvement in a number of key air quality indicators, a recharge of some groundwater to near normal levels, a slowing in the loss of prime agricultural land to urbanization and an increased restoration of wetland habitats.

The Central Valley's depressed economy has dramatically slowed the use of prime land for new homes and commercial space. It has also given local and regional governments time to prepare and begin using blueprints to improve urban housing density and transportation choices.

However, the Central Valley has many red flags when it comes to the environment.

The number of days that ozone levels were above state and federal air quality standards has increased overall since 2005, and almost all counties in the region are not meeting the

PUBLIC POLICY

David Hosley is New Executive Director

David Hosley joined the SNRI in January in the newly created position of executive director. He is carrying out a new business plan for the institute and is coordinating programs of the National Parks Institute, which is being incubated in SNRI.

He works with Coty Ventura, management services officer, and Alexis Valle, purchasing specialist to support SNRI's needs. They are the core office team working to assist all affiliated

one-hour and eight-hour air quality standards for many days each year. The percentage of the Valley's population at risk for respiratory problems because of poor air quality outpaces other California regions.

The level of nitrates in drinking water has increased due to use of nitrogen-based fertilizers and planting nitrogen-fixing cover crops. Poor soil drainage has damaged fragile ecosystems. In some cases, the numbers have increased beyond the proportional rise in population.

The report is one in a series that measures five rotating topics. The indicators have been used widely by local elected officials, the State Legislature, health and economic researchers and environmental nonprofit organizations to inform public policy and foundation investments in the region.

faculty, researchers and graduate students.

Prior to joining SNRI's staff, Dr. Hosley served for two years as interim vice chancellor for University Relations. He joined UC Merced as president of the Great Valley Center in 2008.

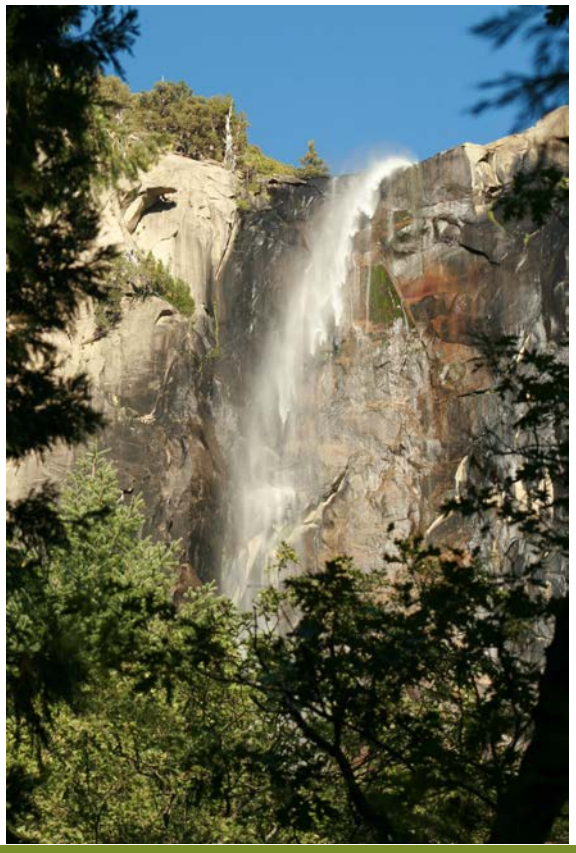
Dr. Hosley currently serves on the American Leadership Forum National Board and is secretary of the California Asian Pacific Chamber of Commerce Board of Directors. In that role, he represented UC Merced and SNRI at the China International Import-Expo in April.

A former broadcast journalist and manager, Dr. Hosley has coordinated growth in SNRI's internet presence, including more print and video content and a new electronic newsletter. Dr. Hosley also serves on the UC Merced Athletics Board and assists the Research Center for Community Engaged Scholarship.

SNRI's profile and visibility has been significantly updated with the migration to the new website at snri.ucmerced.edu as well as the addition of a public information representative, Lorena Anderson.

David Ardell and colleagues used a comparative genomics approach to infer ancestral genome organization and evolutionary scenarios through a pseudo-Boolean linear algorithm that could predict inversions, duplications, substitutions, and insertions (*Research in Computational Molecular Biology*, April 2012).

Andy Aguilar and colleagues discovered that prolonged periods (one to two months) of absolute food and water deprivation stimulates ATP degradation and decreases ATP synthesis, resulting in the accumulation of purines; also, the fasting seals possess a high capacity for purine salvage/ recycling, which contributes to ATP supply and amelioration of oxidant production (*Journal of Experimental Biology*, May 2012).



RESEARCH HIGHLIGHTS

Yihsu Chen and colleagues compared tradable permits and carbon taxes for the adoption of clean technologies for a coal-fired plant, finding offset and other price-control mechanisms are likely to delay clean technology investments (*Energy Journal*, 2011).

Mike Dawson found that speciation of *Stigmatopora* pipefishes between Western Australia and New Zealand occurred in parallel, suggesting similar environmental processes caused similar geographic patterns of diversification in two distinct lineages (*Molecular Ecology*, January 2012).

"Our challenge at UC Merced is to seek out support and recognize and reward research and teaching that tackles questions and issues that transcend any one discipline."
- Kathleen Hull

Benoit Dayrat and colleagues constructed 10 new complete mitochondrial genomes of pulmonates (Mollusca: Gastropoda) and demonstrated their impact on phylogenetic relationships (*BMC Evolutionary Biology*, October 2011).

Roger Bales and colleagues estimated snow water equivalent across the Upper Merced and Tuolumne River basins of the Sierra Nevada of California for 2004 and 2005 using remotely sensed fractional snow-covered area, finding that middle elevations (2100-3000 m) contributes 40-60 percent of annual snowmelt, lower elevations (1500-2100 m) 10-15%, and higher elevations contribute 30-40 percent in both snow basins (*Water Resources Research*, August 2011).

Michael Beman and colleagues analyzed the ammonium oxidation rates of archaea and bacteria in the Gulf of California and eastern tropical North Pacific Ocean, and, through pyrosequencing and quantitative polymerase chain reactions, found that ammonia-oxidizing archaea are active within the euphotic zone while ammonia-oxidizing bacteria are confined to deeper portions of the water column (*ISME Journal*, May 2012).

Asmeret Asefaw Berhe and colleagues studied soil organic matter processes in eroding and depositional landform positions, and discovered that protection of soil organic matter by physical isolation were more effective in poorly drained, lowest-lying depositional landform positions compared to well-drained landform positions in the upper parts of an annual grassland watershed (*Journal of Geophysical Research—Biogeosciences*, 2012).

Henry Forman and colleagues discovered that tobacco smoke activates an enzyme called Src that is critical to the process that allows cancer cells to spread and was able to prevent the smoke from activating by introducing agents that prevent activation of the enzyme (*Free Radical Biology and Medicine*, April 2012).

Teamrat Ghezzehei developed a permeability evolution model that considers deposit morphology, finding that sparse and slender geochemical deposits causes a greater drop in permeability than uniform deposition (*Advances in Water Resources,* January 2012).

Qinghua Guo and colleagues developed a new algorithm to segment individual trees from the small footprint discrete return airborne lidar point cloud from which tree structural attributes can be derived (*Photogrammetric engineering & Remote Sensing*, 2012).

Tom Harmon and colleagues demonstrated the capability of managing soil salinization in real-time using a receding horizontal control algorithm through a small-scale field test, which suggests that it can autonomously achieve water reuse and agricultural objectives while managing soil salinization with adequately structured and trained simulation model, senor networks and optimization algorithms (*Journal of Environmental Management*, July 2011).

RESEARCH HIGHLIGHTS

Wolfgang Rogge and colleagues developed and employed a new sampling system to determine and quantify air pollutants associated with tiny airborne particles with a time resolution not seen before that provides a detailed look into the dynamics of atmospheric chemistry ongoing inside and round airborne particles during summer and winter for the Baltimore area and understand of how atmospheric chemistry may alter aerosol chemistry and human health within a few hours (*Environmental Engineering Science*, January 2012).

To see additional publications, visit snri.ucmerced.edu

Steve Hart and colleagues tested the predictability of below-ground carbon fluxes on the basis of taxonomic identity and genetic marker composition of replicated clones of individual genotypes through a common garden approach, finding that genetic makeup of the plants growing in soil has a significant influence on the release of carbon from soils to the atmosphere (*New Phytologist*, May 2012).

Kathleen Hull reviewed previous research and current understanding of California native prehistoric demography, offering new approaches for archaeological research that encompass the social, rather than simply the ecological, implications of demography (*Contemporary Issues in California Archaeology*, 2012).

Teenie Matlock, with colleague Lilian Davila and a UC Merced undergraduate, investigated the learning effectiveness of immersive 3D virtual reality environments, and discovered new ways to improve the perception of nanostructures, particularly carbon nanotubes (*MRS Online Proceedings Library*, 2011).

Tony Westerling and colleagues used hydroclimate and land-surface characteristics under a range of future climate and development scenarios to predict large wildfire occurrence and burned areas in California, finding that a significant increase in large wildfire occurrence and burned areas are likely to occur by mid-century due to the effects of increased temperatures on evapotranspiration and reduced precipitation (*Climate Change*, 2011).

National Parks Institute is Expanding to Meet Leadership Challenges

At a time when protected lands around the globe are under increasing stress from reduced government resources, an innovative institute incubated within the Sierra Nevada Research Institute is arming today's and tomorrow's park leaders with knowledge and approaches to sustainability.

A key element of NPI is its Executive Leadership Seminar, a joint effort among a handful of partners that aims to link park leaders from around the world and give them the opportunity to share ideas, skills and tools for thinking and working on a strategic scale. The National Park Service, Stanford University, Great Valley Center and Institute of the Golden Gate joined UC Merced in the NPI partnership this past year.

The intense, 11-day workshop was held in April and brought together 27 emerging leaders from parks in 13 countries, taking them from Cavallo Point in the Golden Gate National Recreation Area to UC Merced, and culminating in Yosemite National Park.

INTERNATIONAL

Newest SNRI Faculty Affiliate Has World View

Erik Rolland is as at home in Shanghai and Canada as he is in his native Norway or Yosemite National Park. Rolland came from UC Riverside in January, and joined Tony Westerling as UC Merced faculty leadership of this year's National Parks Institute, which included more than a dozen parks and protected lands from Lebanon between Cameroon to Mongolia.

The Ernest and Julio Gallo Professor of Management represents UC Merced in a consortium of six eminent American universities that offer a certificate in Leadership for Public Lands and Cultural Heritage. The group plans to move toward a graduate degree as a next step to building a network of universities providing advanced training and research on parks and open spaces worldwide.

"Public lands face challenges that are unique, in that they require a holistic view of how to address key management problems," says the new SNRI faculty member, who brings experience in strategic management, information systems, operations research and disaster response to his research efforts.

Dr. Rolland studied in both the U.S. and Norway, receiving undergraduate and

During the whirlwind seminar, participants immersed themselves in discussions about theories of change, management, organizational renewal, strategic planning, impacts of climate change on ecological systems, generational changes in park workforce and visitors, and illegal activities in parks and open spaces.

Sula Jacobs, deputy superintendent of Florida's Biscayne National Park, said that the seminar showed that the problems faced by U.S. park leaders are universal.

"We all have visitors from different areas; we have ecological issues, natural resource issues and funding issues that are occurring," she said.

UC Merced and the National Park Service plan to expand NPI to create a virtual forum for managers of parks and public lands. UC Merced also has plans to add an expert in park management to its faculty and increase research efforts in subjects relevant to the adaptive management of parks and other protected spaces.

graduate degrees from Ohio State University and graduate degrees from both the Norwegian School of Business Administration and the Norwegian Institute of Technology. He has had academic affiliations with Shanghai Jiatong University and the University of Alberta, and has consulting on a range of business problems on three continents.

He is currently the faculty lead on a study of models for sustainable management of California State Parks and leading the curricular planning for next year's National Parks Institute seminar.

Becca Fenwick Leads Yosemite Field Station

As the new director of UC Merced's Yosemite Field Station, Becca Fenwick combines her love of the outdoors and of the educational opportunities such settings can offer.

"I have always been drawn to the world around us and love to foster that in others," Fenwick says. "Field stations and Yosemite in particular provide a venue in which to do this on many levels, from public outreach to cutting-edge scientific research."

The Yosemite Field Station is used by SNRI researchers along with other University of California faculty and guest researchers. It is also the home of the Yosemite Leadership Program for UC Merced undergraduate students and the Adventure, Risk, Challenge program for San Joaquin Valley teenagers to gain confidence in their language skills while taking on physical challenges in a team setting.

"Becca is an experienced scientist and natural reserve manager," SNRI Director Roger Bales observes. "Her enthusiasm and vision will take the Yosemite Field Station to the next level as it supports signature programs for UC Merced and the broader community."

YOSEMITE FIELD STATION

Kathleen Hull Advances Anthropology and Archaeology

When the audience listened to UC Merced professor Kathleen Hull's talk about the archaeology of Yosemite Indian life this summer at Parsons Memorial Lodge on the edge of Tuolumne Meadows, it came from someone who not only knows Yosemite today, she knows about the region's people before there was recorded history.

Dr. Hull's presentation focused on the Colonial Period, and comes from the double context of anthropology and archaeology. She studies prehistoric demography, along with hunter-gatherer societies of western North America and colonial encounters in the Americas. Once an archaeologist for the National Park Service in Yosemite, Dr. Hull has done environmental compliance work for an international engineering firm, both of those experiences leading up to an appointment in 2006 as one of the founding anthropology faculty members at UC Merced.

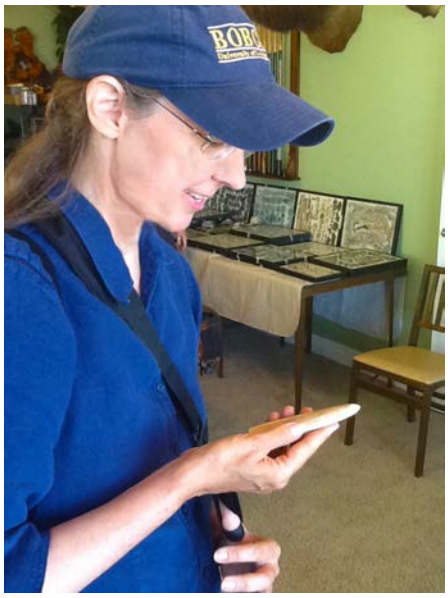
It's not a surprise, then, that Dr. Hull is an advocate for cross-disciplinary scholarship. And that includes understanding those who have come before us and how they lived and died.

Dr. Hull has a way with titles for some of her research. Her 2009 book is "Pestilence and

The complete renovation of the Data Visualization Center (DVC) was a major change at the station this year, and was completed using National Science Foundation stimulus funds. A new shake roof was installed on the building, and has already been adopted by the park as the new standard for shake roofing in Wawona.

The DVC can be used as a place where researchers gather to analyze and interrogate their data. Large screens and fast internet access will play a vital role in this, along with the flexible set up of the desks and chairs. It is also able to host retreats, conferences and classes, further expanding the ability of the field station to serve a wide variety of people who work in and visit the park.

Persistence: Yosemite Indian Demography and Culture in Colonial California," and last year she contributed a chapter in a Cambridge University Press volume that she titled "Death and Sex: Procreation in the Wake of Fatal Epidemics within Indigenous Communities." She uses those titling skills as associate editor of the journal of California Archaeology, and is undertaking a new research project for the National Park Service on dating artifacts of Bodie Hills obsidian via hydration analysis. Such tools are common in the north portion of Yosemite National Park, and this dating method examines the uptake of molecular water into the obsidian over time to gauge how much time has passed since artifact production. In this way, the age of camp and village sites can be determined, a necessary first step in any archaeological research project.



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Professor of Engineering, Chair
Roger Bales
Professor of Engineering and Faculty Director, SNRI
Henry Forman
Professor of Natural Sciences
David Graber
Chief Scientist, Pacific West Region, National Parks Service
Tom Harmon
Professor of Engineering
Kathleen Hull
Associate Professor of Social Science, Humanities and the Arts
Tony Westerling
Associate Professor of Engineering

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Chair, California State Park and Recreation Commission

Gary Freeman
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Jaymee Marty
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Bill Phillimore
Executive Vice President, Paramount Farms

Tim Quinn
Executive Director, Association of California Water Agencies

Kim Stanley Robinson
Author

The Director's Council is being formed and will commence by summer 2012.

Associated Faculty

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Roger Bales
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Asmeret Berhe
Elliot Campbell
Yihsu Chen
Martha Conklin
Michael Dawson
Benoit Dayrat
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Carolin Frank
Teamrat Ghezzehei
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Peggy O'Day
Erik Rolland
Wolfgang Rogge
Samuel Traina
Tony Westerling
Roland Winston

SNRI

UC MERCED

SIERRA NEVADA RESEARCH INSTITUTE
ANNUAL REPORT | 2012 – 2013

SIERRA NEVADA RESEARCH INSTITUTE – A GROWING ENTERPRISE

Thank you for your interest in the Sierra Nevada Research Institute (SNRI). We hope this annual report, covering July 2012 through June 2013, will give you a sense of SNRI's activities and the research efforts of its 30-plus faculty members, their staff and students. This past year has seen significant growth and change.

ROGER BALES, *Director, SNRI*

Executive Director David Hosley retired in June, and new Executive Director Steve Shackelton has already begun work. We welcomed four new members of SNRI: Jessica Blois, YangQuan Chen, Gerardo Diaz and Marilyn Fogel. Professor Fogel also became director of the Environmental Analytical Laboratory, which continues to be supported by SNRI staff.

We also welcomed Chris Swarth as director of the proposed Vernal Pools Grasslands Reserve, which is more than 6,000 acres adjacent to the UC Merced campus footprint. An evaluation of our application for inclusion in the University of California Natural Reserve System resulted in a "strongly support" recommendation. UC regents will consider approval in the months ahead.

Cognitive science Professor Teenie Matlock is starting the new Center for Climate Communications through SNRI, where she and her postdoctoral researcher Timothy Gann are conducting interdisciplinary study of how scientists, journalists, politicians, educators and everyday people talk about issues related to climate, including climate variability. Their plan is to widely disseminate information to various groups, including governmental agencies, nonprofit organizations and educational institutions at the local, regional and international level.

Our Yosemite Field Station continues to be a gem for research and the youth programs under its umbrella: the Yosemite Leadership Program for UC Merced undergraduates and the Adventure Risk Challenge program for at-risk high school students from the San Joaquin Valley.

We were pleased also to have eight undergraduates from UC Merced and other colleges and universities at the field station getting invaluable research experience under the direction of National Park Service mentors and UC Merced faculty through the Research Experience for Undergraduates Program this summer.

In May, Professor Martha Conklin assumed responsibility for directing UC Merced's NRS resources, including the Yosemite Field Station and Vernal Pools-Grasslands Reserve. This places the NRS under the vice chancellor for research, with SNRI providing administrative support.

As of this writing, our institute is supporting 31 research grants for a total of $13.1 million. This is significant during a time of sequestration for the federal government, and increased competition for research support.

In the past year, we have also increased SNRI's impact on public policy, providing research-based input to county officials, members of the Legislature and Congress about some of the key environmental and social challenges of our state and nation. In particular, helping leaders understand and deal with climate change is becoming a bigger part of the work of our institute and its faculty members.




"With a decade of successful scientific investigation and partnership behind us, SNRI looks forward to another challenging year of research and scientific contribution to scholarship and society in 2013-14."

MARTHA CONKLIN, *Interim Director*

CELEBRATING A DECADE OF DISCOVERY AND NEW KNOWLEDGE

This year marks the 10th anniversary of the Sierra Nevada Research Institute, although the concept was first recommended in 1999 by a committee of directors from existing UC organized research units, supported by UC Merced Director of Academic Planning Karen Merritt.

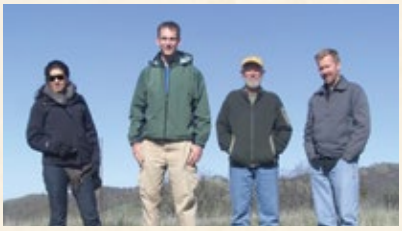
UC Santa Barbara Professor Frank Davis led the committee. Davis and Merritt, joined by Jerry Mitchell, assistant to the superintendent of Yosemite National Park, looked at a number of sites for a field station, resulting in the selection of Wawona. Davis also played a leadership role in the search for a leader of the new institute.

Sam Traina, now vice chancellor for research, began as SNRI's first director in the summer of 2002. Over the next year, four other faculty members accepted offers to join him: Roger Bales, Martha Conklin, Tom Harmon and Peggy O'Day, followed by Henry Forman, Valerie Leppert and Roland Winston.

"I spent a lot of the early timeframe in meetings with the National Park Service, meetings with state agencies and NGOs, and just talked about what the vision was for the institute," Traina recalled.

Mitchell was one of the NPS managers listening with interest. He helped organize a brainstorming session at Yosemite to develop research questions that UC Merced faculty members could address.

That partnership with the NPS is still going strong today. The National Parks Institute, Yosemite Leadership Program, Research Experience for Undergraduates and field work in Yosemite and Sequoia-Kings Canyon are legacies of efforts made before UC Merced had any students.

SNRI SCIENTISTS CONSULTED ABOUT CLIMATE CHANGE BY POLITICAL LEADERS

In April, Rep. Henry Waxman, ranking member on the Committee on Energy and Commerce for the U.S. House of Representatives, requested input from Sierra Nevada Research Institute regarding climate change.

SNRI Director Roger Bales and affiliate scientist Norman Miller from Berkeley National Laboratory offered him answers to his questions, stressing the impact change will have on the state's water supplies.

What are the most serious threats facing Northern California because of climate change?

Northern California, in particular northeastern California, is projected to have increased warming with early snowmelt and runoff. It is very likely that there will be more intense wintertime storm events impacting both inland and coastal regions, and it is very likely that there will be flooding during these events. Perturbations to our water supply will stress both infrastructure and decision-making capabilities.

What are the most serious threats facing Southern California because of climate change?

While Southern California is also expected to receive intense precipitation events during the winter, it is very likely to have an overall reduction in precipitation. The most serious threat from climate change is a decrease in fresh water and an increase in intense wildfires because of drying of the landscape and increased development at wildland interfaces.

Sea-level rise will impact port infrastructure, as adjustments to docks, jetties and other fixed platforms will need to be altered. The Central Valley Project and the State Water Project pumping plants are at risk of failure if flooded.




How will climate change affect precipitation and water availability in California?

Precipitation modeling has large uncertainties, however, a fairly robust signal across models indicates that Northern California will receive an increase in intense precipitation events during the winter and Southern California will have a very likely decrease. The annual cumulative amount of precipitation is likely to be about the same, but we're likely to see redistribution, with intense precipitation periods alternated with very dry years.

Overall, the state is likely to experience 50 percent to 150 percent more critically dry years. Water availability is certain to be more variable, as observations indicate California precipitation is becoming more and more variable.

It is likely that a multi-year drought will occur, as has occurred numerous times in the past, however future droughts may be longer lasting.

The shift from snow to rain in the Sierra Nevada, decreased snow-cover area, coupled with longer growing seasons, are certain to result in more wintertime stream flow and less summertime stream flow, impacting water delivery during the growing season.

This loss of snowpack storage will reduce water security for California.

How will rising sea levels affect coastal communities? Are certain parts of California's coastline more vulnerable to sea level rise than others?

Evidence based on satellite observations and models indicate that melt rates of land-based ice is accelerating and that sea level rise may be much higher than thermal expansion alone, which may be more than 1 meter.

Regions most at risk are those with low-lying infrastructure and communities.

Coastal communities will be impacted with higher storm surge events resulting in flooding.

Major cities, including San Francisco, San Diego and Los Angeles are at risk of flooding. Nuclear and coal power plants at or near the coast have been mapped and analyzed for changes in 100-year, 50-year, 10-year and one-year flood events. The San Francisco Bay and delta are at high risk for flooding during combined intense precipitation, sea level rise and storm surge.

How will climate change affect the health of the Pacific Ocean?

Ocean acidification and increasing temperature will reduce diversity and impact migration. This is observed during warm-water years with low-latitude fish populations migrating far north beyond historic domains. Coastal fog might decrease in the future, impacting crops (e.g. grapes) and ecosystems (e.g. redwoods) that depend on this moisture and cooling.

To what extent will climate change increase the frequency and severity of heat waves in California? Which part(s) of the state will be most affected by heat waves? How severe will these heat waves be? Which populations will be most vulnerable to the effects of heat waves?

Analysis of climate observations and models indicate that present day heat waves – multiple days with temperature in the top 5 percent of historic warmest days – will increase by two to four times the current level. By mid-century, California temperature increases are very likely to range between 2 degrees and 5 degrees, and by the end of the century, increases are likely to range between 3 degrees and 10 degrees.

Local heating during the summer is very likely to be much higher, with nighttime temperatures remaining high. With our current fossil fuel emission path, we will likely experience entire summers at our current 5 percent warmest temperatures.

Heat waves may occur anywhere in the state, but it is important to note that high-population density regions, people who lack sufficient cooling, and the elderly and children are most at risk.

Parts of the Central Valley where temperatures can soar beyond 110 Fahrenheit, as experienced in Sacramento for two weeks in 2005, may become annual occurrences.

This is likely to have a major impact on agricultural works and others in the Central Valley.

MAKING THE MOST OF SAN JOAQUIN WATERSHED RELEASES

A team of a dozen SNRI researchers is probing whether Californians could see a better yield from one of our region's greatest natural assets, the southern Sierra Nevada.

The researchers seek to include climate-driven changes in discovering the optimum times and amounts to release water down the San Joaquin River, connecting advances in understanding mountain climate and hydrology to changes in response in downstream ecosystems under human management.

Led by engineering Professor Tom Harmon, the team is analyzing data from a number of sources to take a new look at both the hydrologic processes and ecosystem functions in the river's basin, particularly given that climate warming was not considered in court-ordered releases.

"It's possible we may not be able to meet the mandated releases at all times," said Harmon, "especially the low ones in late summer, if the snow melts earlier."

The research involves seven state and federal agencies overseeing resource management in a very sensitive climate zone, and at a time that a restoration program is underway on the lower San Joaquin River to improve habitat for salmon and other wildlife.

Water releases affect the San Joaquin Valley's top economic driver, agriculture, as well as hydropower production, timber management, and even tourism in one of the most bountiful and beautiful parts of America.

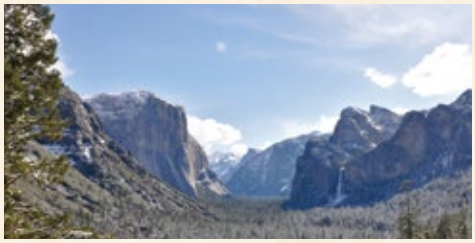
The Sierra Nevada snowpack is the largest water reservoir in California, said Harmon, and climate change could reduce annual storage significantly over the next several decades.

The research team intends to clarify the understanding at the process level of the relationship between climatic variation, watershed structure and the biophysical setting, especially at mid- and high elevations.

The work will produce models of what might happen to the ecology at the lower portions of the river if regulated releases from dams change, including how groundwater and surface water interacts.

The researchers use modeling software that can simulate a forest, a tree at a time, and what happens when precipitation falls as rain more often than snow than in the past because of climate warming.

An update on the research will be part of the 2014 San Joaquin River Conference, which will be held at UC Merced.


NATIONAL PARKS INSTITUTE ADDS STATE PARKS RESEARCH INITIATIVE

Despite the disappointment of postponing this year's NPI Executive Leadership Seminar to 2014 because of travel restrictions related to federal government sequestration, UC Merced's National Parks Institute is growing with the addition of research and the planning of seminars for the California Department of Parks and Recreation.

Funded by a grant from the S.D. Bechtel, Jr. Foundation, engineering Professor Erik Rolland is working with Steve Shackelton, the new executive director of SNRI, and Armando Quintero on several aspects of capacity building for the California State Parks system.

Rolland is developing methodologies for analyzing park visitor feedback through online user comments to better understand customer satisfaction with parks, as well as meet park users' changing needs.

Shackelton and Quintero are also collaborating with Rolland and the leadership of state parks and its supporters to develop

a series of adaptive management seminars that could address aspects of the challenges facing California's system, including new models for park management, leveraging technology, diversifying funding streams and preparing for climate warming. An initial seminar is planned for fall.

A survey of participants from the first three years of the NPI seminar reveals the course's lasting effects, with 96 percent saying they would recommend the Executive Leadership Seminar to colleagues or friends, and 91 percent saying they are applying knowledge from their seminar in their management of parks and other protected lands around the world.

Among the comments from the survey:
"The NPI seminar is nothing short of a life-changing experience. The new perspectives opened through the place-based learning, and the relationships gained, have broadened my outlook that affects every professional decision that I make."

"I have continued to apply what we learned in many aspects of my work. The international connections have been very valuable and are one of the most important parts of the seminar."

"The time we spent on the UC Merced campus was the most valuable to me. This is a model that should be replicated nationally."

The planning group from UC Merced, the National Park Service, Institute at the Golden Gate and Stanford University will use the survey feedback to plan for the future of the National Parks Institute.

FIRST SAN JOAQUIN VALLEY RESERVE NEARING UC APPROVAL

A three-member panel representing the UC Natural Reserve System recommended UC Merced move to establish the Vernal Pools-Grasslands Natural Reserve adjacent to the campus.

Panel members made a two-day visit in late spring, and the panel reported it "strongly supports" the more than 6,000-acre reserve becoming part of the UC Natural Reserve System.

There are 38 natural reserves in the UC system, but few of them are adjacent to a campus as UC Merced's will be.
UC Merced is bustling with nearly 6,000 students, but it is also home to a variety of animals, including some endangered species, which will give students and faculty members – as well as researchers from around the world – a unique opportunity to conduct science.
The property is filled with wildlife, from rare birds and salamanders to rabbits, coyotes, and ground squirrels. It is also covered in vernal pools that are home to five different species of endangered fairy shrimp.

Chris Swarth, manager of the planned reserve at UC Merced said, "These are tiny invertebrate animals not large enough to eat, perhaps only a half inch in length, and they're uniquely adapted to living in these vernal pools, which are only filled with water for part of the year."

Swarth is working to develop policies to provide students and faculty members more access to study this unique environment.

> "We're also going to be bringing students from the college as well as the community, K-12, out here to learn about this ecosystem so that they can begin to appreciate what the pools are, how they work and why they're important," Swarth said.

Students appreciate added research opportunities that also allow the protection of the campus's natural surroundings.

"It's cool how we're still going to preserve our green campus," UC Merced student David Fahim said. "Even though this is a small school and they want to expand, they're still taking into account the environment, which I think is really awesome."

Faculty and graduate students shared their thoughts about the proposed Vernal Pools-Grasslands Natural Reserve when members of the UC Reserve System panel visited.

"I'm excited about the possibility of the reserve as an asset in starting a field ecology program at UC Merced," Professor Stephen Hart told the panel members, who came from from UCs Santa Cruz, Davis and Berkeley.

> **"There has only been one of me to do that, but with a reserve, we could start curriculum development that would teach how to sample a community and develop research questions about ecology. The potential for a reserve here is extremely high."** PROFESSOR STEPHEN HART

"This place lends itself to cross-discipline research, which UC Merced values," said Professor Marilyn Fogel, who is also faculty director of UC Merced's Environmental Analytical Laboratory. "We need an area close by to teach basic ecological method." "It's a great introductory experience," said Professor Asmeret Behre, who has been taking classes out to see the proposed reserve since 2009 to teach soil science. Her students take core samples and visit the lab to see how analysis is done. Behre said having the land so close makes field work easy, especially because enrollments in her class have been growing steadily.

"The reserve will allow us to make a connection to nature. Building that connectedness can help us grow pro-environmental behavior," said graduate student Chelsea Arnold. She pointed out that many UC Merced students come from urban centers in California, so this is a new experience for them. She believes becoming part of the UC Natural Reserve System would help attract graduate students, a key goal of the university over the next handful of years.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REPORT ON THE CENTER FOR CLIMATE COMMUNICATION AT UC MERCED

Timothy Gann was hired in February 2013 as a postdoctoral researcher to work with Professor Teenie Matlock on research focused on climate change communication, and the development of a Center for Climate Communication at UC Merced.

So far, they have identified key questions and issues to pursue, including:

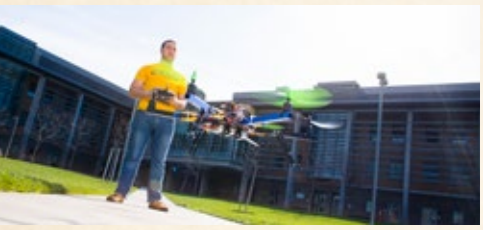
- How do stakeholders talk about climate change?
- How does language influence beliefs and perceptions about climate change?
- How can language be used to motivate proenvironmental action?

They have also created database of research articles related to climate change communication by designing a program to extract articles from select news sources on the web, for the purposes of creating a database of online media related to the discussion of climate change; constructed an initial website; mentored an undergraduate research assistant, Teal Mandzik; started an article on framing in environmental language; started a collaboration with Rick Dale and Alex Paxton focused on analyzing the media corpus mentioned previously, with the nearterm plan of preparing a presentation for the Society for Computers in Psychology Conference; and are in the process of creating a design and stimuli for an experiment on how grammatical aspect (the way language relates actions to time) influences views of climate change.

Matlock and Gann have been consulting with Tamara Wall of the Desert Research Institute on language use and research design for her work on wildfire warnings and on a survey; and submitted a $100,000 proposal for funding with the Merced Region submission for the Prop 84 Implementation Grant, in collaboration with Professor Martha Conklin.

Plans for 2013-14 academic year include submitting manuscripts to peer reviewed journals, an updated website targeting local and regional stakeholders regarding climate change impacts important for the San Joaquin Valley, Sierra Nevada and California; developing a toolbox for the center aimed at local stakeholders; planning and executing workshops aimed at helping raise awareness of center issues with local stakeholders; gathering grant funds; creating an advisory committee for the center; holding an academic workshop; leading seminars and more.

Plans beyond the coming year include outreach to area schools, connections with other campuses and researchers and much more.




UC MERCED TAKES TO THE SKIES FOR RESEARCH

People these days have an image of drones as relentless, emotionless, efficient killers that have become the U.S. military's weapon of choice in the war on terror.

But here in the Valley, that perception is changing. Drone technology is being harnessed to help, rather than hurt. At only a few feet wide and costing well under $1,000, UC Merced student Brendan Smith's unmanned aerial vehicle, or UAV, bears little resemblance to an expensive killer drone.

It needs little space, and can be packaged with all kinds of data-gathering software to monitor soil moisture or crop health, for example, or with cameras to help locate hot spots in wildfires or monitor air quality to let firefighters know when it is safe to enter a burn area.

"All we need is a very small area. We can do it in the middle of crops; we can do it anywhere," said Smith.

What the UAVs lack in flash, they make up for in possibilities.

Professor YangQuan Chen and his MESA Lab students are exploring the many ways UAVs can make life easier and safer – from search-and-rescue

operations to monitoring thousands of miles of natural-gas pipelines for leaks. Easy to use is something you hear a lot from the professor. He came to the UC Merced from Utah State, bringing a $300,000 NASA sponsorship and one goal: Make UAVs accessible for agriculture.

"We'll be able to measure water levels, salinity levels, many things for agriculture," UC Merced student Sean Rider said.

Work is underway to create a personal UAV that can help farmers monitor crops using sophisticated sensory equipment. It's called "Print and Fly" and with the help of a 3D printer, would allow farmers to simply print a new wing or tail if one breaks.

"The UAV can be used so that optimal strategies can be applied, in terms of harvest, applying water, applying nutrients or to control pests," Chen said.

But standing in the way is a growing fear UAVs could be used to violate the privacy of everyday citizens. In many states, laws are already being drawn up to restrict their use.

MESA Lab participants aren't letting that slow them down – they are conducting robust experiments all the time, and could soon use UAVs to map and plot the proposed natural reserve adjacent to the UC Merced campus, to help inventory wildlife, including endangered species, and monitor the health of the land.

"The most exciting thing is when we are trying out a new piece of equipment or trying out a new algorithm that we have no idea if it's going to work," said UC Merced student Paul Bennett. "We'll test it out up in the air – sometimes it will work, and sometimes it doesn't."

That's all part of the science of new technology.




MARILYN FOGEL BRINGS BIG QUESTIONS TO UC MERCED

From the microbes in the guts of living things to the idea of life elsewhere in the universe, Professor Marilyn Fogel is pondering some of life's deepest questions.

When and how did life originate on Earth? What does the future hold for our planet? Are we alone in the universe?

"When you go back through time, there are bits and scraps of life everywhere," Fogel said. "It's ubiquitous."

As a geobiologist, Fogel, who joined UC Merced in January, explores these questions and more using stable isotopes of carbon, oxygen, hydrogen, sulfur and nitrogen, the elements that form the building blocks of all living organisms. She is setting up the campus's first natural-abundance stable-isotope laboratory, and will run the Environmental Analytics Laboratory, as well.

She came to UC Merced after 35 years at the Carnegie Institution of Washington's Geophysical Laboratory, where she was a senior scientist, and joins Professor Jessica Blois in paleoecology and paleoclimate studies, and Professors Asmeret Berhe, Peggy O'Day, among others, as part of the Earth sciences research roster.

Fogel and Blois, who joined UC Merced last fall, are two examples of the stellar research team for which the university is rapidly becoming known.

Fogel's wide variety of research interests, including biogeochemistry, geobiology, marine sciences, astrobiology, paleoecology and paleoclimate and geology, encompass the natural world and will add to the diverse array of scholarly work being produced on campus.

Her work has earned her a prestigious award this year: the 2013 Treibs Award from the Geochemical Society, in recognition of her scientific contributions to organic geochemistry. She is the first woman to receive the award since its inception in 1979. Fogel was elected a geochemical fellow in 2003.

Her research has taken her to some of the Earth's remotest and most interesting places, including far northern Canada, Belize, Western Australia, India, Norway and the Sargasso Sea. Her research is used here on Earth and in space, including on Mars missions.

PROFESSOR CAROLIN FRANK LOOKS INSIDE TREES FOR ANSWERS

Professor Carolin Frank is concerned with the inner lives of trees.

She looks inside them to see whether microbes are part of and perhaps critical to life functions such as growth.

"It's a pretty new field," Frank said. "Most people think of bacteria as causing disease, but they can be beneficial. When I look at a forest, I don't see trees; I see all these fascinating microbes."

Bacteria, she said, have been found to promote growth and protect plants from stress, and also to fix nitrogen, a critical component of plant health.

"Microbes are the only organisms that can take nitrogen from the air and make it available to plants," she said. "Plants cannot do it themselves. People have long wondered where all the nitrogen in forests comes from, and if bacteria are fixing the nitrogen in conifers, that could explain it, and would also explain why conifers can grow in places where there is no nitrogen, like gravel."

Until recently, nitrogen gas in the atmosphere has been available only through microbes that can "fix" it by breaking its strong nitrogen-to-nitrogen triple bond and making it available to other organisms, such as plants.

Human activities, such as artificial nitrogen fixation and fertilization, have altered Earth's nitrogen balance, with huge implications for ecosystems and climate.

Frank's research looks into the inner workings of pine trees.

A better understanding of the microbes that fix nitrogen inside plants could help reduce fertilizer use and improve forecasts about climate change.

Frank's work, similar to that of other UC Merced faculty researchers such as Ajay Gopinathan, is helping change the way people understand the world around them down to its smallest parts, some of which have the biggest impacts.

Frank, a computational biologist, and her two graduate students venture into forests for samples of conifers, then back to the lab for deep analysis of what's inside the trees' needles and inside the tree cells.

She worked on a bacterial inventory in Colorado conifers with fellow UC Merced Professor Lara Kueppers. Both are affiliated with the Sierra Nevada Research Institute, and members of the School of Natural Sciences.

Part of what makes her research enjoyable, Frank said, is that it is interdisciplinary, including genomics, the environment, symbiosis and microbiology. Frank's current research takes her into Yosemite to collect more samples to see if findings in this region match up with what she found in Colorado.

The Colorado pines contain a bacterial species known to fix nitrogen in sugarcane.

"Now we need to see if it's doing the same thing in the pines," she said. She is mining the genome sequence of a bacterium that lives inside meristematic cells, which Frank calls trees' stem cells. She wonders if the microbes are transferring something into the plant nuclei to promote growth.

UNDERGRADS GET SUMMER EXPERIENCE LIKE NO OTHER

Many universities offer the Research Experience for Undergraduates (REU) program, but they don't have what UC Merced has to offer.

"Yosemite really draws people in," said Professor Stephen Hart, one of the REU program leaders. "Other REUs might take students into the field, but not into a national park."

The National Science Foundation has awarded UC Merced a $318,000, three-year grant to take eight undergrads from around the country to live in the park for nine to 10 weeks each summer and gain invaluable experience working directly with faculty researchers on projects.

"Living and working in Yosemite was the best experience of my undergraduate career," said Raymond Gutteriez, a California State University, Fresno, grad and REU student in 2009. "Before the REU program, I knew nothing about the National Parks Service (NPS) or the U.S. Geological Survey (USGS) and what they do. I learned a lot about different career paths into natural resource management and research."

UC Merced had a summer REU program between 2008 and 2010 led by Professor Benoit Dayrat. Sierra Nevada Research Institute-affiliated Professors Hart and Michael Beman wrote a successful grant proposal to NSF to renew the highly popular program beginning this year, with the help of Becca Fenwick, UC Merced's Yosemite Field Station director.

Leaders accepted applications from students all over the country, though they targeted students from California's Central Valley who might not otherwise have the opportunity to get research experience as undergraduate students.

The program ran from June 16 through Aug. 17. Students are matched with one of nine projects proposed by UC Merced faculty members and scientists from the NPS and USGS, looking at animals, plants, lakes, rivers, meadows, mountains, people and places of Yosemite.

"The main experience we want to offer is an intensive research experience in one of Earth's most beautiful places," said Beman. "The students perform scientific research and learn skills that will be valuable for future work, but we also hope this is a unique life experience for them.

"It is really important to teach our next generation of scientists how to do research, and the best way to do this is to get them directly involved – get their hands dirty and their feet wet! And this is more than just learning how to measure something in a lab – it is about testing hypotheses and analyzing data, and those are skills that are widely applicable."

Gutterriez, who majored in biology with an emphasis in ecology, is a member of the Wuksachi Band of Mono, Native Americans who lived in the Sierra Nevada. He applied to the REU program because he wanted to continue his ancestors' legacy of stewardship of the land and a balance between humans and the environment.

His project involved examining the effect of fire on the occupancy and reproductive success of California spotted owls, a species of special concern in the state, using data he collected and data from his USGS mentor's Ph.D. project.

He's heading to New York soon for grad school at the State University of New York College of Environmental Science and Forestry in Syracuse, where he'll work on a forest project with the Menominee Nation of northeast Wisconsin.

Like Beman, who was an REU student when he was in college, Gutteriez is finding that the experience is still paying off as the program contributed to his life's ultimate goal.

"I want future generations to look at the world we have stewarded for them and be proud of their ancestors," Gutteriez said. "That's why I applied to the REU program."

Here's a sampling of SNRI faculty research from July 2012 through June 2013:

David Ardell and colleagues developed a comparative genomics approach for inferring ancestral genome organization and evolutionary scenarios, published in the Journal of Evolutionary Bioinformatics, February 2013.

Roger Bales and colleagues examined the elevation-dependent influence of snow accumulation on forest greening, published in the Journal of Nature Geoscience, September 2012.

Roger Bales and colleagues investigated the ability of a densely instrumented watershed to capture catchment-scale snow depth and soil moisture distributions and found it effectively characterized catchment-wide distributions of depth in real time, published in the Journal of Water Resources Research, September 2012.

Michael Beman and colleagues quantified ammonia oxidation rates and the distribution of ammonia oxidizing archaea and bacteria in marine sediment depth profiles from Catalina Island, published in the Journal of Microbiology, July 2012.

Yihsu Chen and a colleague developed dominant firm competitive fringe models that account for market power, published in the Journal of Energy Economics, September 2012.

Yihsu Chen took a theoretical approach to the impact of power market structure on carbon dioxide cost pass-through to electricity prices under quantity competition, published in the Journal of Energy Economics, July 2012.

YangQuan Chen and colleagues further developed Podlubny's matrix approach to discrete fractional calculus: non-equidistant grids, variable step length and distributed orders, published in the Philosophical Transactions of the Royal Society, April 2013.

YangQuan Chen and colleagues demonstrated efficient control of a SmartWheel via the Internet with compensation of variable delays, published in the Journal of Mechatronics, May 2013.

Ricardo Cisneros, Qinghua Guo, Samuel Traina and colleagues analyzed the effects of the 2002 McNally fire on air quality in the San Joaquin Valley and southern Sierra Nevada, published in the International Journal of Wildland Fire, July 2012.

Michael Dawson and colleagues identified genetically and oceanographically distinct blooms of jellyfish using genetic analyses and oceanographic modeling, published in the Journal of the Royal Society Interface, September 2012.

Michael Dawson and colleagues advanced the understanding of the magnitude of marine species diversity by compiling the first register of marine species of the world, published in the Journal of Current Biology, December 2012.

Marilyn Fogel and colleagues found that microbial community composition and endolith colonization at an Arctic thermal spring are driven by calcite precipitation, published in Environmental Microbiology Reports, May 2013.

Marilyn Fogel and colleagues observed that nitrate competition in a coral symbiosis varies with temperature among Symbodinium clades, published in the ISME Journal, June 2013.

Carolin Frank and colleagues explained the horizontal transfer of host-adaptability systems in bacteria, published in Horizontal Gene Transfer in Microorganisms, September 2012.

Teamrat Ghezzehei and colleagues found that degradation of moist soil aggregates by rapid temperature rise under low intensity fire, published in the Journal of Plant Soil, January 2013.

Qinghua Guo and a colleague presented a new method for accuracy assessment in species presentabsence models, published in the Journal of Ecography, April 2013.

Qinghua Guo and colleagues crafted a case study from the Sierra Nevada National Forest to see how allometric equation choice impacts lidar-based forest biomass estimates, published in the Journal of Agricultural and Forest Modeling, November 2012.

Kathleen Hull and colleagues studied recent excavations at two southern California sites and recognized ritual action and intent in communal mourning features of the coastal locations, published in the Journal of American Antiquity, January 2013.

Asmeret Asefaw Berhe, Teamrat Ghezzehei and a colleague developed a new UV spectrophotometry based method for rapid determination of carbohydrate and total carbon concentrations, published in the Journal of Carbohydrate Polymers, May 2013.

Asmeret Asefaw Berhe and colleagues looked at mechanistic considerations and problems with terminology in the study of erosion, deposition and the persistence of soil organic matter, published in the Journal of Earth Surface Processes and Landforms, May 2013.

Jessica Blois and colleagues tested the space-for-time assumption and found that in predicting climate-change efforts on biodiversity, space can substitute for time, published in the Proceedings of the National Academy of Sciences, May 2013.

Elliott Campbell researched the response to embodied energy and emergy analyses of a concentrating solar power system, published in the Journal of Energy Policy, May 2013.

Robert Innes and a colleague studied the relationship between rural income distributions and changes in environmental conditions in parts of India and found that all strata benefit from an improved environment, published in the American Journal of Agricultural Economics, November 2012.

Robert Innes and a colleague conducted deception experiments in Arizona, India and California and found that dishonesty is contagious, published in the Journal of Economic Inquiry, January 2013.

Lara Kueppers and colleagues tested the hypothesis that climate warming promotes uphill redistribution of subalpine tree populations, published in the Journal of Oecologia, January 2013.

Teenie Matlock and colleagues developed a method to measure responses to stimuli in the absence of visual stimulation, published in the Journal of Cognitive Processing, August 2012.

Teenie Matlock and colleagues studied the interaction of grammatical aspect and temporal distance in motion descriptions, published in Frontiers of Psychology, May 2013.

Peggy O'Day and colleagues investigated reactive transport modeling of subaqueous sediment caps and implications for the long-term fate of arsenic, mercury and methylmercury, published in Aquatic Geochemistry, July 2012.

Erik Rolland and colleagues investigated how social networks are impacting fraudulent behavior, published in the Journal of Computer Fraud and Security, July 2012.

Tony Westerling and colleagues examined future humidity trends over the western United States in the CMIPS global climate models and a variable infiltration capacity hydrological modeling system, published in Hydrology and Earth Systems Science Discussions, December 2012.

Tony Westerling and colleagues developed key findings about changes among land cover, species distribution, ecosystem processes and human land use, published in Climate Change in the Southwest United States: A Report Prepared for the National Climate Assessment, March 2013.




SNRI PARTNERS WITH GLOBAL TIGER INITIATIVE IN ASIA

New SNRI Executive Director Steve Shackelton has been interested in conserving critical habitats since he was a boy.

He has made a career of stewardship for parks and other protected lands, having combined public policy with a range of operations management in Washington, D.C., Alaska, Hawaii and California before retiring as chief ranger of the National Park Service last year.

Now he's working at the international level for UC Merced, joining engineering Professor Erik Rolland in probing policy and research questions related to the World Bank's initiative to address complex economic, environmental and political issues in the shrinking habitats of tigers and other endangered species.

These endangered lands closely mirror some of the most impoverished regions of the world, and the Global Tiger Initiative seeks to conserve lands by developing economic incentives for people who live there to join in the effort.

Shackelton was a featured speaker at the Second Asian Ministerial Conference on tiger conservation last October in Thimphu, the capital of Bhutan. He addressed ministers from 13 counties in the tiger range, presenting the idea that parks are an economic generator that can boost regional economies while retarding habitat loss.

Shackelton outlined a systems approach to the challenge, one that links partners through policy creation, new scientific knowledge and shared stakeholder value. He emphasized youth education and using technology to increase effectiveness to assure better outcomes in the future.

Rolland, an expert in systems approaches to adaptive management, will join Shackelton in Bhutan in October as part of a World Bank team that includes Clemson University in presenting a seminar for countries in snow leopard and/or tiger zones.

They also will seek research opportunities in Asia and talk to potential graduate students who would go on to study parks management and ecosystem protection at UC Merced.

OUR MISSION

THE MISSION OF THE SIERRA NEVADA RESEARCH INSTITUTE (SNRI) AT UC MERCED is to discover and disseminate new knowledge that contributes to sustaining natural resources and promoting social well-being in the Sierra Nevada-Central Valley region, and related regions worldwide. SNRI accomplishes its mission by:

- Fostering interdisciplinary research that focuses on the Sierra Nevada eco-region, including the Central Valley and other adjacent areas;

- Facilitating synergistic links between science, the arts, education and natural resource management

ABOUT SNRI

SNRI Leadership

ROGER BALES, *academic director* (on sabbatical July through December 2013)
MARTHA CONKLIN, *interim academic director*
STEPHEN SHACKELTON, *executive director*

SNRI Advisory Committee

STEPHEN HART, *chair, professor with the School of Engineering*
HENRY FORMAN, *professor with the School of Natural Sciences*
DAVID GRABER, *chief scientist, Pacific West Region, National Parks Service*
TOM HARMON, *professor with the School of Engineering*
KATHLEEN HULL, *associate professor with the School of Social Science, Humanities and the Arts*
TONY WESTERLING, *associate professor with the School of Engineering*

SNRI Director's Council

JAY CHAMBERLIN, *chief of the Natural Resources Division, California State Parks*
MIKE CHRISMAN, *director of the Southwestern Partnership Office, National Fish and Wildlife Foundation*
MICHAEL EATON, *owner of Kingbird Farms*
GARY FREEMAN, *principal hydrologist and manager of water management and power generation for PG&E*
KEITH GILLESS, *dean of the College of Natural Resources and professor of forest economics at UC Berkeley*
CARYL HART, *chair of the California State Park and Recreation Commission*
JAYMEE MARTY, *senior ecologist for Vollmar Natural Lands Consulting*
MONTE MITCHELL, *director of the Atwell Island Water District and partner in M&M Farms*
RICHARD MOSS, *principal at Provost and Pritchard Consulting Group*
BILL PHILLIMORE, *executive vice president of Paramount Farms*
TIM QUINN, *executive director of the Association of California Water Agencies*
MARK REYNOLDS, *senior ecologist for emerging projects at The Nature Conservancy*
KIM STANLEY ROBINSON, *author*
ESTE STIFEL, *Central California District manager at the Bureau of Land Management*

SNRI Office Staff

COTY VENTURA, *management services officer*
ALEXIS VALLE-AREVALO, *administrative specialist*
STEFANI CHAMPIE, *administrative assistant*
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MARK PEREZ, *financial analyst in the research division*

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Notes for SNR I Annual report for 2013- 14 (an annual report for this year was not completed)

Over the past year, engaged in development of the new web site, as well as the maintenance of the old site. These efforts are highlighted below.

Old site: We've made over 100 corrections and updates. The architecture behind the pages is corrupt, poorly structured, and inconsistent throughout the site. As a result, it is difficult to figure out, maintain, and manage edits. Worked with Amy Lozano-Smith, Lorena Anderson, and Jennifer Biancucci to make repairs and start visioning from that work what the new site can learn from the old one - and guide improvements based on those lessons. Erin Stacey and Claudia Canales round out the team as capable review, software edit, and support teammates.

New site: Working over the last nine months with Amy as she designed the new campus universal website style and structural format in Drupal 7. Amy just got the new format approved by the chancellor on April 17th, and wants to work with us to develop a state of the art SNRI site as a model for the rest of the campus. The new site will not require taking down the old site, but will be developed off-line. When it comes on-line, it will be matched (behind the pages) with structures and systems that are universal to the campus, easily maintained, but with pages that reflect our design and content preferences. Working with the faculty, researchers, and labs to collect photographs and content ideas. Working with Amy to secure a newsletter format that is agile and easy to update. Lorena has assisted us with feature options that are cutting edge and attractive. The goal is for anyone logging on, anywhere in the world, to want to dwell in our site, learn our people, research, and activities – find it attractive and easy to contact us for information, collaboration, or to make a donation.

Five-year Review

Preparing for SNRI's five-year review, which will be undertaken this summer.

Work continues with faculty and campus offices to accumulate data around: financials, peer-reviewed publications, grants, projects, Ph.D. graduation rates, student and faculty awards and honors, public and professional presentations, number and type of media features on student and faculty research, impact on state and local policy by engagement with stakeholders, amount and source of extramural student and faculty funding. Examining similar reviews in other institutions to learn content expectations.

Annual Report

Through interviews with individual SNRI faculty, IPA, and administrative staff, gathering the data and stories for the 2013/14 edition of the SNRI annual report. Worked through the fall with Jennifer and Lorena to reconstruct the report's design format into a standard template to maintain high stylistic integrity, readability, and to avoid the quality breakdown we saw with last year's initial publication. That edition was completely redone and reissued electronically using the *Issue* software, see:
http://issuu.com/ucmerced/docs/sierra_nevada_research_institute_an?e=9191161/6358789

The Issue software creates a high definition electronic rendition that simulates turning pages in a journal with a mouse click. This year's edition will emphasize research metrics and will have modifications that identify the status of core programs and distinctions regarding programs under incubation. The *Issue* rendition will be ideally suited for the new website.

Dovetailing the work of the five-year review with this project to ensure consistency and the efficiency of only gathering the information once from faculty members, researchers and supporting offices. In addition to stories on particular research initiatives (done on a rotating basis for representation of SNRI breadth), content will include the same data as the review:

financials, peer-reviewed publications, grants, projects, PhD graduation rates, student and faculty awards and honors, public and professional presentations, number and type of media features on student and faculty research, impact on state and local policy by engagement with stakeholders, amount and source of extramural student and faculty funding.

Directors Council

Planned and organized the Sacramento semi-annual SNRI directors council meeting with Armando Quintero. The meeting was held at the headquarters of the Resources Law Group, in part to exercise and strengthen our relationship with RLG Director, Michael Mantell and his staff – particularly Mary Schoonover and Julie Turrini who are significantly and financially supporting our work with the California State Parks Institute. Also as a thank you salute to RLG's pivotal role in securing the Packard Grant for the establishment of UCM.

The meeting was well attended and In addition to Roger, Martha, Armando and I, included: Caryl Hart (Director, Sonoma County Parks), Ed Smith (The Nature Conservancy), Michael Eaton (Kingbird Farms), Jaymee Marty (Environmental Consultant), Monte Mitchell (South San Joaquin Rancher and Agricultural Water Expert), Este Stifel (BLM Deputy Regional Director), and Lynn Huntsinger (Professor, Berkeley).

Invited Teenie Matlock to be the featured speaker to assist her in rolling out the Center for Climate Communication.

The meeting spun out an opportunity to take Ed Smith to Yosemite to explore research collaboration possibilities between The Nature Conservancy, SNRI, and the park, in fire and climate. Attended the park science symposium and introduced Ed to: Dr. Jan Van Wagtendonk (USGS Scientist Emeritus), Dr. Lee Tarnay (Air Quality Scientist), Joe Meyer (Branch Chief Physical Science) Don Neubacher (Superintendent), and Kent Van Wagtendonk (GIS Manager). Plan to do a similar trip to Sequoia to build and exercise our TNC-SNRI-NPS network.

The meeting also spun out an opportunity for UCM to work jointly through Este Stifel with BLM and California State Parks on a coastal management and research possibility.

2020 Focusing Exercise

Working with Martha and Kathleen Hull to iterate improvements to the SNRI submission. Canvassed the other 2020 submissions and inserted language in our proposal to link at least five other proposals for research and funding efficiencies and team opportunities on projects. Work will continue until finals are called.

Tom Harmon – Sensing the America's Freshwater Ecosystems Risks: SAFER

Tracking with Tom Harmon on this NSF project between UCM, Canada, Uruguay, Chile, Argentina, and Peru. Will assist Tom in having the SAFER joint partners' conference in Yosemite when it is UC Merced's turn to host in the autumn of 2015. Will create an opportunity for the land management community in California to meet leading researchers in the Western Hemisphere in this thematic area of study. It is hoped this will grow enthusiasm for UC research capability in the regional community of practice and result in better crest to valley coverage in our Sierra water research agenda. And better competitive advantage with NSF.

Roland Winston – University of California Advanced Solar Technologies: UC Solar

Working with Roland Winston to establish a UC Solar research portfolio in Yosemite National Park. This work springs from an old UCM and Yosemite relationship between Roland and a number of operations in the park – also Roland's generous help in the development of the MRPI proposal for the Center for Parks and Protected Area Leadership. The project will capitalize on

Yosemite's innovative use of solar for conventional energy infrastructure and its new cutting edge telecommunications network. The collaborative will focus on proving technologies in Yosemite and exporting them to beneficial deployment in parks throughout the world – thereby field-testing innovations to non-park peaceful uses in remote settings in the broader context.

Teenie Matlock – Communication and Perception of Wildfire Risk

Working with Teenie Matlock and Tony Westerling on resubmission of this proposal for funding, which was originally submitted through Fall 2013 call for the Joint Fire Sciences competition: National Park Service, BLM, U.S. Forest Service, Fish and Wildlife Service, Bureau of Indian Affairs, and US Geological Survey. The proposal was not selected by JFS. We are attempting to resubmit through a secondary route, directly to the National Park Service – for regional or Boise science funding. This project will use the backdrop of the Rim Fire to study public perception of risk related to wildfire and changing climate and try to learn how those perceptions can guide better agency communications about threat and broader communication and learning around climate.

John Vollmar – Sensitive Lands Offset and California High Speed Rail Project

Through an acquaintance developed during the vernal pools reserve project, interested (with Erik and Armando) in developing a protected lands research opportunity with John Vollmar now that he has been named by the governor's office in an oversight role in the identification of sensitive lands and offset selections for the rail project. It is hoped this could result in positive outcomes for conceptual protected areas such as a Tulare Basin site as well as research funding in this area of environmental policy (the abstract of offset lands as protected areas), see: **http://www.tularebasinwatershed.org/sites/default/files/sites/all/default/files/pdf/2013.10.24_TBWG.GP_MeetingMinutes.pdf**.

George Melendez Wright Society – UC Merced

The advisory council of the George Wright Society is preparing to invite UC Merced to establish (along with perhaps Clemson and Texas A&M) the first student chapters of the society. The chapters would reinforce the society's mission: "protection, preservation, and management of cultural and natural parks and reserves through research and education", see: **http://www.georgewright.org/**. This is an historic first and is being offered to UC Merced because of UCM's track record of interest in research around the sciences that impact park management and our particular focus on, and outreach to youth from all backgrounds in society. This latter having an essential impact on perceptions of relevance by all demographics on public policy on conservation and the sustainability of a park system in the future. George Melendez Wright studied forestry and vertebrate zoology at Berkeley, joined the National Park Service in Yosemite in 1927 and is credited with establishing science as the foundation for management in national parks in the United States. This distinction would likely help with the chancellor's goals to increase graduate students because of the branding and would likely foster enthusiasm around research themes in the parks, forests, and reserves because of the endorsement by the Society. UC Merced is being invited to speak on the NPI seminar project in April, 2015 at the Society bi-annual conference in Berkeley.

Innovate to Grow and Engineering Capstone Research

Worked over the last two semesters with Dan Hirleman to establish capstone projects within Yosemite National Park. The target is to open up a research dialog with Yosemite in the area of engineering to complement the other natural and social science initiatives underway and create a new SNRI research front. By opening up this conversation, it is hoped that a partnership for advanced research projects will develop that move the chancellor's goals for increased graduate study, additional motivation for recruited new faculty, and usefulness to the park. It is further hoped that this will model for Sequoia-Kings Canyon and Lassen Volcanic National Parks and the surrounding national forests – and grow the SNRI research portfolio

This effort hosted two successful capstone projects. One involves design and construction improvements to a propane gas recovery and repurposing machine. The other designed an alternative electrical power facility for the radio repeater site at Wawona Point. The second project has led to a potential internship this summer, involving a graduating student in Roland Winston's photovoltaic CAD course and possible PG&E line removal that would result in a significant environmental restoration outcome on the western edge of the Mariposa Grove of Giant Sequoias. Park Service Director Jon Jarvis and Secretary of the Interior Sally Jewell will visit this area on June 30th – during 150th anniversary of Yosemite and they will be briefed on this SNRI relationship.

UC Center for Service Science

Worked with Paul Maglio to advance public and professional recognition for the research mission of his new center. Took Paul to Yosemite to meet Delaware North COO Dan Jensen and Ahwahnee Hotel General Manager Brett Archer to explore research project possibilities in the realm of concession services on federal and state protected lands – as a novel niche for UCM, SNRI and CSS to occupy.

Also discussed research in the domain of the delivery of service in the government context and looked at issue points in Yosemite. Lectured in two of Maglio's service science courses.

California State Climate Adaptation Strategy Workshop

Worked with Deputy Secretary for Climate Change and Energy, Ann Chan and Assistant Secretary Amber Pairis of the California Natural Resources Agency to site the San Joaquin Regional Climate Adaptation Strategy Workshop at UC Merced on October 10, 2013. There were five of these workshops held in five regional centers of the state to present information on climate impacts and collect input from the public that will inform the governor's multi-disciplinary policy strategy on climate.

Invited Teenie to be the introductory speaker to ensure her new Center for Climate Communication was on the governor's radar and a relationship could be developed between Teenie, Ann, Amber, and SNRI. Also targeted UCM being viewed statewide as a thought leader in research having to do with climate and its relationship to water, fire, communication and other relevant areas of investigation.

This also gives us another point of science contact with Secretary John Laird, who has been a champion for the UC Merced research and education relationship with the reforms currently underway for California State Parks and the establishment of its institute (CSPI, see below).

Natural Reserves – Vernal Pools, Yosemite, Lassen, Tulare Lake

At Martha's request, maintained a support relationship with Chris Swarth's direction in the establishment of the Merced Vernal Pools Grassland Reserve. Worked with Chris and the NRS people in the Office of the President under Peggy Fiedler through meetings in Oakland, on campus with the three-campus review team, the UCM strategic planning group (Phil Woods, Gene Barrera, Richard Cummings) as well as California Fish and Wildlife Regional Manager Dr. Jeff Single, Senior Environmental Scientists Annee Ferranti, and Krista Tomlinson.

Working with Becca Fenwick and Peggy to explore establishment of a Natural Reserve relationship and field site in Lassen Volcanic National Park with its home base at UC Merced. Lassen Superintendent Darleen Koontz is a good professional partner and followed me in the Bevinetto Congressional Fellowship, serving in the U.S. Senate Energy and Natural Resource Committee in 1998, after my internship in 97. There is a good possibility of connecting a new line

of research possibilities with SNRI and the UC Center for Parks and Protected Areas Leadership through an eventual NRS designation at Lassen.

California State Parks Institute

On April 10, 2013 Roger Bales, Armando Quintero, Erik Rolland and I met with California State Parks Director Anthony Jackson and his senior executive staff at the UC Center in Sacramento to engage in discussion over the concept of establishing a California State Parks Institute. The CSPI would serve as a platform for research on key issues in park stewardship and management, a portal for graduate study, a resource for executive education and a potential manifestation of the program of reforms urged by the Little Hoover Commission, the Parks Forward Commission and Director Jackson's Strategic Plan. It would be a joint venture between SNRI and the nascent school of management in whatever form that school takes in its evolution on campus.

That meeting resulted in an agreement to proceed under the direction of Roger at SNRI and Erik, establishing the UCM management program. Working with Erik and Armando, initial introductions were made through visits to Elizabeth Goldstein at the California State Parks Foundation and a strategic planning session of foundations, NGO's, and philanthropy at the Gordon and Betty Moore Foundation headquarters in Palo Alto – where the lead on an overarching reform financing strategy was moved to Michael Mantell at the Resources Law Group.

Met with Stanford University (Susan Feland, Charles O'Reilly, Erik Rolland) to secure use of their extensive executive education multimedia case library at UC Merced. This initiative utilizes Stanford's expertise in case-based education, and affords UC Merced access to an outstanding video-case collection on managing parks and protected areas.

Working over the last year with Armando, approximately $1.3 million has been raised to fund the first CSPI activity, six executive courses of 30 participants each at Asilomar and Marconi Cove – and to launch activity planning a research program for California State Parks as an adaptive input product of the educational component. A program of research, executive education and graduate study is expected to follow.

This initial funding pathway is envisioned through encouraging conversations with the various partner organization officers, to lead to future research and educational grants at UC Merced (SNRI and CSPI).

Confirmed funding partners include: Save the Redwoods League; California State Parks Foundation; the Stephen David Bechtel Foundation; the Resources Law Fund; and California State Parks. Additional funding is expected (but not yet confirmed) from Sempra Energy-San Diego Gas and Electric and Union Bank.

The first three 2013 courses are expected to begin in September after the visitor season concludes. The second three courses will be presented in the winter, spring and fall of 2015.

Drafted the contract for the cooperative agreement between UC Merced and the California Natural Resources Agency in the late summer of 2013 and organized meetings with Sacramento (Rolland, Quintero) and UCM (Thea Vicari, Mark Perez, Coty Ventura), to hone the language for content and legal sensitivity. The document is in final review for signature between Thea Vicari at UCM and Elizabeth Garcia and Theresa Bober in Sacramento. The contract is expected to be ready for signing by both parties next week.

This initiative has become a signature effort of current state parks reform and is now specifically called out in the Little Hoover Commission Report, the State Parks Director's Strategy and the video minutes of the initial Parks Forward Commission meeting in Sacramento. UC Merced is featured as the go-to campus in the system.

The effort has produced promisingly enduring relationships with officers at Bechtel, RLS, Save the Redwoods, the State Parks Foundation and several other foundations, environmental groups, and NGOs in California. This network is expanded nationally through the composition and reputation of the Parks Forward Commission membership.

Our hope is that these relationships produce support for the broader research agendas of SNRI and the Center for Parks and Protected Area Leadership.

UC Center for Parks and Protected Area Leadership

For a variety of converging reasons, a multi-campus, multi-disciplinary center is seen as an ideal solution for optimal research, education, and service outcomes for UC Merced and its relationships with park-focused partner organizations. A long history of partnership with Yosemite, Golden Gate, and Sequoia-Kings Canyon National Parks through NPI has generated programs of research, teaching, and internship that need a solid home. The same is true for newer, but vital relationships with California State Parks. A *UC center* (like an *ORU* or *MRU*) can provide an operating platform that is recognized as a valid research base by the other campuses and labs and can serve to channel their incredible research and teaching energy into our campus.

Likewise, our proximity to and track record with parks can dock research curiosity and teaching talent from the other nine campuses into parks through a UCM portal in an incomparable way. Further, our relationships are with flagship parks in the national system and one of the finest state park systems in the country, so the quality of professional engagement and the high order of issue relevance is also unmatched. Because park and protected area organizations around the world look at Californian examples in issues research and management practice, our relationship is globalized by definition.

A successful profile will drive research, attract grants, and recruit graduate study from state, national, and international sources – to UC Merced, SNRI and the center.

Our current funding partners are expressing a keen interest in supporting a UC parks leadership center. Our practitioner partners in the National Park Service, California State Parks and USGS are also expressing excitement and support for the research and educational outcomes possible from such a forward-looking entity. No similar program exists in the world to our knowledge.

Existing corporate and NGO partners such as ESRI, the Smithsonian Institution, and the World Bank Institute are also voicing encouragement and joining with UCM in cooperative work in the United States and Asia – and perhaps, this summer in Africa.

This center is ideally a collaborative between Erik Rolland's embryonic management group and the well-established SNRI as the foundational base and hub nucleus for the other nine campuses and labs.

A draft proposal for the "planning path" is prepared with the help of Susan Carter for submission June 1st to the Office of the President under MRPI. The grant would total $300,000 over two years. It would bring together six campuses initially as a small nimble planning team to scope, plan, and launch the center by 2016.

The center would become the home for the National Parks Institute and its affiliated programs after direction from Martha to spin the NPI group out of SNRI. The NPI executive alumni keeps us in touch with 80 senior leaders from parks and protected areas in 32 countries, with jurisdiction on all seven continents and holds the possibility of research relationships in natural and social sciences as well as policy, law and management in all of those regions. In the spring of 2013, a survey on the efficacy of the seminar was conducted and rendered positive results – most elements supported above the ninetieth percentile (see results on the second attachment).

NPI also maintains a support relationship between Yosemite and Charles Nies over the Yosemite Leadership Program and its agenda to advance access for young people from all of the diverse backgrounds in California – and create pathways to undergraduate and graduate education, careers in federal and state service, and to build better citizens (per Carol Tomlinson-Keasey's vision under the initial agreement with the National Park Service and currently supported by Chancellor Leland). Will have the opportunity to brief President Napolitano on this program in Yosemite on July 24 when she visits the park to see YLP in action with Chancellor Leland.

ESRI

Working with Jack Dangermond CEO of ESRI and Erik Rolland on a research partnership with ESRI, SNRI, MIST, SpARC, NPI and the conceptual center for parks leadership to advance cutting edge applications of spatial analysis and GIS in research and education on our campus.

Visited Jack's corporate campus in Redlands March 2013 to cement and reinforce this relationship, which has been exercised since Jack's involvement in NPI in 2009. The meeting included Shawn Newsam (founding member of SpARC), Brett Wright and David White from Clemson (in their collaborative role with NPI), as well as David DiBiassi (ESRI Education) and Ken Blankinship (ESRI California Partners Program). As a result, Jack has offered his facility as a convening place for our meetings on the development for the Center for Parks and Protected Area Leadership; CSPI lecturer participation; continuing support for SpARC, CSPI, and NPI (free ArcView licenses for course participants); and the possibility of collaboration in an eventual UC Sierra summer campus.

Community Outreach and Research Engagement

Working in the community to advance awareness of SNRI and MIST's mission and activities in the region, including: speaking at four Rotary events in Merced (Jan and Sam), Mariposa and Yosemite; meeting with members of county government in Mariposa on UC programs of research (Supervisor Kevin Cann and Dr. Chuck Mosher and two supervisor candidates); and a later May meeting with Mariposa's Economic Development Corporation (Marilyn Saunders) on the value of UC research in community prosperity.

Took HSRI directors Steve Roussos and Trevor Hirst - and CCC Director Teenie Matlock to Yosemite to meet Chief Ranger Kevin Killian and his staff to explore research themes that could be jointly launched by SNRI, HSRI, CCC, MIST, and the Center for Parks and Protected Area Leadership in at least the following areas: management issues involved in delivery of community and visitor service at the medical clinic in Yosemite; accident and fatality prevention; zoonotic disease (Hanta virus, Lyme disease, plague); perception of risk and multicultural filters on risk communication; community wellness and equitable access to parks; parks as engines of economic growth as a salient issue in policy on poverty. This launched the beginning ongoing relationship serving the establishment of a research program.

Invited to sit on Yosemite's international affairs committee to coordinate possible international research opportunities with Yosemite's sister parks, which are envisioned to include at least one park on each continent. In the case of Asia, will include Yosemite's two existing sister parks in China and possibly three in Nepal, including Sagarmatha and Chitwan. Chitwan links to the work Erik and I are doing with the World Bank Institute. These partnerships will be celebrated and highlighted during the 150th anniversary of the park this summer when delegates from each country will be in park and available to meet the chancellor (as a fellow invited guest).

Have had preliminary discussion with Dan Hirleman and Mark Aldenderfer, Yosemite's Superintendent Neubacher and Chief of Staff Michael Gauthier, as well as Erik, Steve Roussos, and Trevor Hirst about the idea of Sierra Nevada research paired with Himalayan research on a full spectrum of multi-disciplinary themes that could include: water, energy, park management,

species and ecosystem management, economics, poverty and prosperity, green engineering, and social science. The distance between Thimphu, Bhutan and Kathmandu, Nepal is the same as Bakersfield to Auburn and the issues are strikingly similar between the two regions. UCM already has programs at work in these areas within most of the schools and under Erik's leadership, we are working with a consortium that includes George Mason, Clemson, the Smithsonian, and the World Bank that includes 20 counties in Asia. It is hoped that the Blum Center for Developing Economies will take an interest in the potential for synergy between SNRI, HSRI, MIST, and an Asian mountain component - to support mutually beneficial research and the vigorous exchange of results that benefit the people, policies, and programs of both regions. This project, if undertaken, would likely advance the chancellor's quest for increased graduate study, international student recruitment, and possibly more attractive recruitment and retention of top-flight faculty.

Working with Charisse Sydoriak and Karen Nydick (Resource Management and Science Sequoia-Kings Canyon) and Marc Meyer (Ecologist Sierra National Forest) on the very beginning of a potential five-year project to develop research around resource management issues related to climate - and reflective NPS and Forest Service management policy. This project could involve as many as 60 partners in the Sierra and San Joaquin and should include SNRI and MIST if successful.

UC Sierra

From an initial launch in 2013 from Sam Traina, Kyle Hoffman, and Jan Mendenhall, (and with support of Superintendent Neubacher) exploring the opportunity of establishing the first node of a conceptual UC Sierra on the NatureBridge campus being constructed at Henness Ridge in Yosemite. The campus, which is engineered to be energy net zero, LEED platinum, and cost about $60 million is accessible to UCM as a summer campus pending the result of a feasibility assessment. Have worked with NatureBridge on this project to secure a 120-day period to develop a concept plan and feasibility study. To that end, worked with J Michael Thompson, Steve Roussos, Trevor Hirst and Vic Castillo (Lawrence Livermore National Laboratory), and Margaret Heisel (Office of the President) to begin to put together the assessment and discuss curriculum and research elements of an eventual summer and extension program that would be linked to the entire UC system as well as partner universities (i.e. Stanford, Harvard and others) and high school systems throughout the U.S. and globally. This campus with its advanced architectural and engineering features and curricular thrust advance many of President Napolitano's strategic values as well as those of UCM. Hoping to tour the president and chancellor on the campus in July during President's Napolitano's visit.

Global Environmental Leadership for Resource Conservation

Jointly with Erik Rolland, working over the last two years on the establishment of a sustained relationship with the World Bank Institute, Clemson University, George Mason University, and the Smithsonian Institution to create a portal for UC Merced research by establishing the program "Global Environmental Leadership for Resource Conservation". The process and program have yielded flourishing relationships with 20 countries in Asia and two in Africa, and have already allowed for collection of research data, and the creation of cross-university research efforts[i].

[i] China, Nepal, Russia, Viet Nam, Cambodia, Thailand, Lao PDR, Myanmar, Bangladesh, Bhutan, India, Indonesia, Malaysia, Afghanistan, Kazakhstan, Kyrgyz Republic, Mongolia, Islamic Republic of Pakistan, Tajikistan, Uzbekistan, Kenya, and Rwanda

Sierra Nevada Research Institute
Organized Research Unit
Annual Report 2015

UNIVERSITY OF CALIFORNIA

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Sierra Nevada Research Institute
UNIVERSITY OF CALIFORNIA, MERCED

MEMORANDUM

September 15, 2015

TO: Sam Traina, Vice Chancellor Research & Business Development

FROM: Roger Bales, professor & director

RE: SNRI ORU Annual Report 2015

With this letter we submit the Sierra Nevada Research Institute ORU Annual Report for 2015. This report follows the outline that you provided by email on April 13, 2015. Most of the data and information in it were provided by SNRI members and through UC Merced's business information systems.

Since the original Academic Plan for UC Merced was written in 1997, SNRI was envisioned as a research unit that would bring together faculty and researchers to discover new knowledge in this region of California – stretching from the crest of the Sierra Nevada, through the San Joaquin Valley to the central coast ranges of California.

This year's report articulates the power of this idea as expressed through the number of affiliated faculty and the continued breadth and impact of their research on this region. SNRI researchers are regularly sought out by elected officials, utilities, agencies and the media for their insights on issues such as drought, fire and climate. Current statewide conditions highlight the relevancy and importance of this Institute.

In this fourth year of drought, the SNRI faculty working in the Sierra Nevada and the San Joaquin Valley continue developing knowledge that is shaping the future of California and the world. The geographic location of the Sierra Nevada Research Institute with UC Merced in the heart of the San Joaquin Valley brings attention to a region that is critically important to the economy and health of the State of California.

The 33 SNRI researchers are presently operating with grants valued at more than 24 million dollars between 2014 and 2019.

We are about to begin the 5-year review of SNRI. With this report, you can see that from the inception of the Institute the number of faculty and researchers has continued to grow and the demonstrated importance of their work continues to strengthen the University and California.

Sierra Nevada Research Institute

University of California, Merced

Organized Research Unit (ORU) Annual Report 2015

1.) Brief summary of major activities during the past year, including a discussion of how the prior year's goals have been met.

The 2014/15 academic year represents a significant year for the Sierra Nevada Research Institute. The mission of SNRI to develop new knowledge that will sustain the natural resources and promote social well-being in the Sierra Nevada and Central Valley region has been critical for California and the West as we experience one of the most severe droughts in history. The research of many of the Institute's professors and researchers is often cited and featured in all forms of media – from twitter to the nightly national news. This last year, Legislators, State agencies, agricultural leaders, environmental organizations and NGO's have all sought the advice and engagement of the SNRI thought leaders on the issues California is facing in this region and statewide. The researchers of SNRI are being queried almost daily for insight on issues related to the drought, energy, water, fire risk, climate and more. The importance of SNRI was re-emphasized by the UC Office of the President's decision to fund the multi-campus UC Water Sustainability and Security Research Initiative (UC Water). This initiative is under the direction of three SNRI faculty with a 3.5 million dollar allocation from the UCOP. UC Solar, a successful multi-campus initiative led by SNRI Faculty, was also renewed by the UCOP this year.

There are now 33 faculty members and more than 33 professional researchers engaged in SNRI related research at UC Merced. (See pages 3&4 for a complete listing of SNRI faculty and researchers)

Research carried out by SNRI members and their research groups over the past year has provided knowledge that contributes to sustainability of the region, state and global community. Research programs include renewable energy, decarbonizing the economy, more-sustainable ecosystem management and other climate solutions. Through both legislation and public sentiment California has embarked upon a low-carbon path, leading to carbon neutrality. The current drought has highlighted the need for sustainable water management, the focus of UC Water and many other SNRI projects. California's AB 32 and participation in COP 21 have highlighted the need for public support for a low-carbon economy; and research in our Center for Climate Communications, in UC Solar and under many individual efforts contributed to this goal. SNRI faculty are also contributing to the sustainability of UC Merced and UC and a whole, and doing research that can contribute to the UC goal of carbon neutrality by 2015.

SNRI continues to attract world caliber academic talent. In the 14/15 Academic Year, Mohammad Safeeq joined UC Merced in the forests-water-climate position made available with seed funds from the chancellor and matching funds from the US Forest Service. His position is currently supported 50-50 between UC Merced and PSW (Pacific Southwest Research Station, US Forest Service).

Tapan Pathak was hired by the UC Division of Agriculture and Natural Resources (ANR) and is the first climate specialist within this program. This represents a significant milestone for both UC and UC Merced as he is located on this campus in the heart of the San Joaquin Valley.

The 2nd initiative made possible with seed funds from the chancellor has Teenie Matlock leading the Climate Communication Center, which addresses a high priority for research and outreach within UC and the state. Dr. Emmanuel Vincent recently joined the Center, coming from MIT with previous studies on Oceanography and Climate Communications. He brings with him an exciting new project called Climate Feedback. This Center has held two well-attended Climate Communication workshops on campus in the last year.

Programs for the public and broader community remain a robust part of the SNRI program. Research Week was well attended this year and SNRI led off the week with a seminar and symposium with several SNRI Researchers. SNRI is reaching out into the community with the Science Café and public lecture events at the downtown Karmangar Theatre.

2.) Names of persons serving on the unit's Advisory Committee.

Internal: Kathleen Hull (Committee Chair), Josh Viers, Michael Dawson, Asmeret Asefaw Berhe, YangQuan Chen,

External: Koren Nydick, Resources Manager, Sequoia/Kings Canyon National Parks

3.) Dates of Committee meetings :

May 11, 2015 (Committee was appointed in Spring 2015)

4.) Summary of key Advisory Committee recommendations.

- Transfer administrative support for the Natural Reserve System to the Office of Research staff or add to SNRI Staffing to cover increasing workload.
- Develop a stable vehicle recharge and use system in cooperation with TAPS to lessen heavy SNRI staff workload.
- Initiate the 5 year review of SNRI this Fall
- Request 2-year reappointment of Roger Bales as Director, given timing of 5-year review, with further reappointment evaluated after review.
- SNRI Director should participate in Strategic Academic Focusing
- Develop updated Strategic Plan and Business Plan for SNRI.
- Reconstitute the SNRI membership committee, including a new Chair

5.) Copy of Advisory Committee report(s), minutes, or other relevant documentation.

See attachment A: (page 13)

6.) Names of faculty members actively engaged in the unit's research and their supervision of staff and students.

Faculty		
Ardell, David	Diaz, Gerardo	O'Day, Peggy
Bales, Roger	Fogel, Marilyn	Rice, Robert
Beman, Michael	Forman, Henry	Rolland, Erik
Berhe, Asmeret Asefaw	Frank, Carolin	Rogge, Wolfgang
Blois, Jessica	Ghezzehei, Teamrat A.	Sexton, Jason
Campbell, Elliott	Guo, Qinghua	Traina, Samuel
Chen, Yang Quan	Harmon, Tom	Westerling, Le Roy
Chen, Yihsu	Hart, Stephen	Winston, Roland
Conklin, Martha	Hull, Kathleen	Viers, Joshua
Dawson, Michael	Innes, Robert	
Matlock, Teenie	Joyce, Andrea	
Moran, Emily	Leppert, Valerie	

Supervision of students:

7.) Names of undergraduate and graduate students and postdoctoral scholars directly contributing to the unit who are on the unit's payroll:

Faculty / Staff	**Employee Name**	**Title**
Matlock,Teenie	Timothy Matthew Gann	POSTDOCTORAL SCHOLAR-EMPLOYEE
Ventura, Coty	Andre Craig Frise	STUDENT 2
Ventura, Coty	Andrew Martinez	STUDENT 3
Ventura, Coty	Kian Dell Bradley	STUDENT 4
Ventura, Coty	Patrick Michael Woodbury	STUDENT 3

Names of undergraduate and graduate students and postdoctoral scholars directly contributing to the ORU's scholarly work through assistantships, fellowships, or traineeships:

Research Scientists Burkhart, John Hilton, Tim Jepsen, Steven Hunsaker, Carolyn Kueppers, Lara Miller, Norman Pathak, Tapan Quinn, Nigel Rice, Robert Safeeq, Mohammad Stephens, Molly Vincent, Emmanuel **Postdoctoral Scholars** Carper, Dana Birkner, Nancy Gann, Timothy Hays, Cynthia Kupihea, James Lu, Yaqiong Maguire, Kaitlin Moyes, Andrew Reinoso-Maset, Estela Rheinheimer, David Whelan, Mary Yoon, Yeosang	**Staff Researchers** Campanella, Andrea Castanha, Cristina Conrad, Michele Curtis, Chris Green, Elizabeth Harrison, Brent Meng, Xiande Milostan, Jeanne Stacy, Erin Womble, Patrick Yu, Hong **Students** Alvarez, Otto Brown, Sarah Daglio, Liza Gomez Keyser, Alisa Lever, Rebecca Lubetkin, Kaitlin Lucas, Ryan Rungee, Joseph Patton Pickard, Michael Robert Tiebiao Zhao	Nelson, Mia Emyle Arevalo, Ashley Jenni Valle Rodriguez, Bianca Lizzet Iencarelli, Elizabeth Rose Busset , Nicholas Garrett Robson, Lindsay Marie Torres, Ryan Jacob Flanagan, Jacob Patrick Booth, Lorenzo Ade Keyser, Alisa Renae MacNeill, Curtis Araya, Samuel Tham, Christina DeNeve Weeks, Danaan Babich, Erin Stinecipher, James Williams, John Rungee, Joseph Rossi, Nancy Dziegiel, Abigail

8.) Extent of student and faculty participation from other academic institutions.

Note: Not all faculty provided information for this section

REU Students 2015: Yosemite National Park
Stephen Hart and Mike Beman are Co-Pi's
Several faculty acted as student advisors.

Student	**University**
Melissa Anderson	University of Minnesota, Morris
Hannah Besso	Western Washington University
Anna Chovanes	Wheaton College
Lydia Lichtiger	Earlham College
Megan Seeley	University of Wisconsin
Megan Sidran	Lewis Clark College
Alexandra Stucy	Monmouth University

Michael Stemkovski NC State University

Professor	Student/Faculty	Institution
Bales, Roger	Graham Fogg	UC Water/Davis
	Andy Fisher	UC Water/Santa Cruz
	Michael Kiparsky	UCWater/Berkeley
	Hellen E. Dalhke	UC Water/Davis
	Holly Doremus	UC Water/Berkeley
	Steven D. Glaser	UC Water/CZO/Berkeley
	Thomas Harter	UC Water/Davis
	Jay Lund	UC Water/Davis
	Josué Medellín-Azuara	UC Water/Davis
	Samuel Solis	UC Water/Davis
	Kevin O'Hara	UC Berkeley
	William Stewart	UC Berkeley
	Carlos Oroza	UC Berkeley
	Ziran Zhag	UC Berkeley
	Zeshi Zheng	UC Berkeley
	Hunsaker, Carolyn	CZO/USFS
	Anthony O'Geen	CZO/UC Davis
	Peter Hartsough	CZO/UC Davis
	Naomi Tague	CZO/UC Santa Barbara
	Cliff Reibe	CZO/U Wyoming
	Michael Golden	CZO/UC Irvine
	SNAMP Collaborators	*(See Conklin)*
Beman, Michael	REU Students	*(See REU above)*
Berhe, Asmeret	CZO Collaborator	*(See Bales)*
Blois, Jessica	Behrensmeyer, Kay	Smithsonian Institution
	Eronen, Jussi	University of Helsinki
Blois, Jessica	Ferrier, Simon	CSIRO (Australia)
	Fitzpatrick, Matt	University of Maryland Center for Environmental Science
	Gill, Jacquelyn	University of Maine
	Gotelli, Nick	University of Vermont
	Graham, Russ	Penn State
	Grimm, Eric	Illinois State Museum
	Jackson, Steve	USGS Southwest Climate Science Center
	Lawing, A. Michelle	Texas A&M
	Lugilde, Diego Nieto	University of Maryland Center for Environmental Science
	Lyons, S. Kate	Smithsonian
	McGill, Brian	University of Maine
	McGuire, Jenny	Georgia Tech

Professor	Student/Faculty	Institution
	Mychajliw, Alexis	Stanford University
	Polly, P. David	Indiana University
	Williams, Jack	UW Madison
Campbell, Elliott	Not available	
Chen, Yihsu	Not available	
Chen, YangQuan	Not available	
Conklin, Martha	UCWater collaborators	*(See Bales)*
	CZO collaborators	*(See Bales)*
	John Battles	*UC Berkeley/SNAMP*
	Maggie Kelly	*UC Berkeley/SNAMP*
	Steve Stephens	*UC Berkeley/SNAMP*
	Lynn Huntsinger	*UC Berkeley/SNAMP*
Dawson, Michael	Not available	
Diaz, Gerardo	Not available	
Fogel, Marilyn	Alexander, Conel	Carnegie Institution of Washington
	Miller, Gifford	University of Colorado
	Misc.	Stroud Water Research Institute
	Steele, Andrew	Carnegie Institution of Washington
Frank, Carolin	Albalasmeh, Ammar	Jordan University of Science and Technology
Ghezzehei, Teamrat	Bayala, Roger	Institut Senegalais Pour la Recherche Agricole
	Berli, Markus	Desert Research Institute, Nevada
	Carminati, Andrea	University of Gottingen
	Dijkema, Jelle	Wageningen University and Desert Research Institute
	Furman, Alex	Technion Institute, Israel
	Moret, David	Consejo Superior de Iinvestigaciones Cientificas
	Sancho, Carolina Pena	Consejo Superior de Iinvestigaciones Cientificas
	Van Der Ploeg, Marine	Wageningen University
	Van Genuchten, Rien	Federal University of Sao Paolo
Guo , Qinghua	SNAMP	(*See Conklin)*
Harmon, Tom	Allen, Michael	University of California Riverside
	Ayllon, Roxanna	Universidad Austral de Chile
	Chandra, Sudeep	University of Nevada Reno
	Conde, Daniel	Universidad de la República, Uruguay
	Escobar, Jaime	Universidad del Norte, Colombia
	Hanson, Paul	University of Wisconsin
	Helman, Michal	University of Montana
	Hoyos, Natalia	Universidad del Norte, Colombia
	Jones, Stuart	University of Notre Dame

Professor	Student/Faculty	Institution
	Longo, Maria Clara	Universidad Nacional del Sur, Argentina
	Oberbauer, Steve	Florida International University
	Perillo, Gerardo	Instituto Argentino de Oceanografía & UniversidadNacional del Sur, Argentina
	Picollo, M. Cintia	Instituto Argentino de Oceanografía & Universidad Nacional del Sur, Argentina
	Pinto, Adrian	University of Costa Rica
	Reid, Brian	Centro de Investigaciones en Ecosistemas de la Patagonia, Universidad Austral de Chile
	Rundel, Philip	UCLA
	Rusak, James	Queen's University and Ontario Ministry of the Environment
	Schwendenmann, Luitgard	University of Aukland, New Zealand
	Scordo, Facundo	Universidad Nacional del Sur, Argentina
	Scott, Dane	University of Montana
	Silvia, London	Instituto de Investigaciones Económicas y Sociales del Sur
	Velez, Maria	University of Regina, Canada
	Wemple, Beverley	University of Vermont
	Zelikova, Jane	University of Wyoming
	Zilio, Mariana	Instituto de Investigaciones Económicas y Sociales del Sur
Hart, Stephen	REU	See above
Leppert, Valerie	Not available	
Hull, Kathleen	Not available	
Joyce, Andrea	Not available	
Moran, Emily	Not available	
Matlock, Tennie	none	
O'Day, Peggy	Not available	
Rice, Robert	Butler, Leslie	University of California Davis
	Glaser, Steve	University of California Berkeley
	Horwath, William	University of California Davis
	Zhang, Ziran	UC Berkeley
	Steven Glazier	UC Berkeley
Rolland, Eric	1 (no name)	Purdue University
	1 (no name)	Shanghai Jiaotong University
	2 (no name)	University of Alberta

Professor	Student/Faculty	Institution
Sexton, Jason	Blackman, Ben	University of Virginia
	Carscadden, Kelly	University of Toronto
	Hirst, Megan	University of Melbourne
	Hoffmann, Ary	University of Melbourne
	Slatyer, Rachel	University of Melbourne
Westerling, Anthony	Not available	
Winston, Roland	Constance Chang-	UC Berkeley
	Hasnain	UC Davis
	Pieter Stroeve	UCSB
	Umesh Mishra	UC Riverside
	Alfredo Martinez-	UCLA
	Morales	UC Irvine
	Yang Yang	UCSC
	Matthew Law	UCSB
	Michael Isaacson	UC Davis
	Steve DenBaars	UC Berkeley
	Nael El-Farra	UC San Diego
	Ali Javey	UC San Diego
	Sungho Jin	UCSC
	Zhaowei Liu	UC Davis
	Patrick Mantey	UC Berkeley
	Adam Moule	UCSB
	Sayeff Salahuddin	UC Davis
	James Speck	UC Riverside
	Daniel Sperling	UC Davis
	Sadrul Ula	UC Berkeley
	Jerry Woodall	UC Davis
	Ming Wu	UC Berkeley
	Eli Yablonovitch	UC Berkeley
	Adam Durbin	UC San Diego
	Mark Durbin	UC San Diego
Viers, Joshua	UC Water collaborator	(See Bales)

9.) Numbers and FTE of academic research personnel, technical staff, and administrative personnel who are paid through the unit's accounts.

	All accounts
Academic Research Personnel	32 FTE
Technical Staff	2 FTE
Administrative Personnel	13 FTE

See attachment B for a complete listing of these individuals (page 17)

10.) Efforts to contribute to the campus's diversity goals. Contributions to diversity and equal opportunity can take a variety of forms, including efforts to advance equitable access to education, public service that addresses the needs of California's diverse population, or research in a scholar's area of expertise that highlights inequities.

UC Merced has one of the most diverse student populations in the UC system. In all areas, the SNRI students, grad students and employees–reflect California. The new knowledge being created by the SNRI Faculty, researchers and students creates better understanding of conditions, needs and solutions that have a direct impact on low-income, rural and diverse populations. *Note the ethnic diversity represented by the names of the UC Merced undergraduate and graduate students listed in section 7 of this report.*

Two SNRI public programs in the Downtown Merced area have been successful outreach to the local population:

Since 2014, the *Science Café Merced* has held nine monthly events. This program continues to receive a very positive response from the audience as well as the host business, Coffee Bandits. It is designed to fulfill the international Science Café model: an event hosting "*people who may or may not typically get involved with scientific discussions. They are not exclusive club meetings for scientists and science majors, nor do they take place exclusively in lecture halls or science museums"* (Science Café website).

Most contributions to the campus' diversity goals come from the efforts of individual faculty. These include talks to the community and school groups, interviews with local press, op-ed pieces in local and regional newspapers, meetings with students and prospective students and participation in community events. SNRI does not have outreach staff, but does support efforts by campus and individual faculty where possible.

SNRI also sponsored public lectures and conversations at the Karmangar Theatre in downtown Merced. These events are free to the public and have been attended by a wide variety and hundreds of guests from the Merced and surrounding community. Both events included a question and answer period with the audience.

The authors of The West Without Water, Lynn Ingram and Frances Malamud-Roam presented to a full house and addressed the geologic history of major drought in the West.

The author of Dodging Extinction, Anthony Barnosky, spoke about past extinctions and described the indications that we are heading into the 6th extinction. [a]

SNRI is a regular participant in the Merced River Fair which is a local annual event.

11.) List of publications, issued by and acknowledging the unit, including books, journal articles, and reports and reprints, showing author, title, and press run; or other evidence of creative scholarship, such as colloquia, conferences, workshops, performances, and exhibitions. Publications must acknowledge the ORU.

Books: 14
Journal Articles: 145
Reports: 4
Citations: 61
Press Releases: 30

SNRI does not ask faculty, researchers and students to acknowledge SNRI in publications. Some do list an SNRI affiliation, along with a school affiliation within UC Merced. However, SNRI does not explicitly request that members and their research affiliates do this. It is left to the individual to decide what is appropriate for each publication.

See Attachment C for complete listing of articles/press releases by SNRI members and researchers in the 2014/2015 academic year (beginning on page 18)

12.) Sources and amounts (on an annual basis) of income, including contracts and grants, gifts, University support, service agreements, and income from the sale of publications and from services.

FY 14/15 Grants and Contracts	$ 8,107,758.78
UCOP support for UC Water	$ 819,601.00
Gifts	$ 152,761.00
State Funding (SNRI Operations)	$ 492,523.86
FY 14/15 total for SNRI grants/gifts/state funding	$ 8,753,043.54
Total value of current active SNRI Grants (2014-2019)	$24,776,480.76

[a] *Funds provided specifically for research initiatives by UC Merced; not a part of core SNRI budget.*

These are approximate amounts of grants and contracts to SNRI members and researchers. This was compiled from data available from the SNRI MSO, the UC Merced Sponsored Projects Office and the Campus Gift administration Office.

See Attachment E for details (page 42, 43 & 44)

13.) Expenditures from all sources of support funds, distinguishing use of funds for administrative support, direct research, and other specified uses.

General Funds Attachment E (Page 44)

Direct Research	$ 8,107,758.78
Academic Salaries	$ 74,273.80
Career Staff	$ 208,289.86
Student Appointments	$ 28,878.37
General Operations	$ 35,904.25
Travel	$ 17,721.73
Benefits	$ 109,587.00
Other Expenses	$ 9,661.58
Total	$ 8,600,282.54

14.) Description and amount of space currently occupied.

Two administrative office spaces in Science and Engineering Building 1

Science and Engineering Building 1, Room 206 (160 sq ft)

Science and Engineering Building 1, Room 208 (321 sq ft)

Conference room - Science and Engineering Building 1, Room 200 (486 sq ft)

Administrative Office Building (Temporary Modular buildings)

AOB 125 Office (109 sq ft)
AOB 144 Office (107 sq ft)
AOB 145 Office (110 sq ft)

Total square footage: 1,293 sq ft

15.) Summary of ORU goals for the coming year.

- Continue the development of SNRI, UC Merced as the world class research university partner for outstanding engagement with research, governance and policy leaders focused on the Sierra and Central Valley regions, and comparative regions world-wide.

- Develop stronger partnerships with private-sector business and regional development leaders

- Increase funding support from all external sources

- Develop strategic development and funding plans for SNRI faculty and programs

- Develop a more balanced workload for the ORU administrative support staff

- Prepare the 5-year review of SNRI with oversight committee guidance and complete Self Study in Fall -2015

- Further contribute to strategic UC Merced growth and look for opportunities to develop SNRI priorities within the 6 themes of Strategic Academic Focusing
    - *Toward a Sustainable Planet*
    - *Computational Science and Data Analytics*
    - *Chemical and Biological Materials and Matter*
    - *Entrepreneurship and Management*
    - *Human Health Science*
    - *Inequality, Power and Social Justice*

- Provide updated Strategic Plan and Business Plan for SNRI.

ATTACHMENT: A

SNRI ORU Advisors meeting agenda and notes
May 11, 2015
10-11am

Attendees present: Roger Bales (Director) , Kathleen Hull (Chair), Josh Viers, Michael Dawson, Asmeret Asefaw Berhe, YangQuan Chen, Armando Quintero (Staff)
Absent: External Advisor (position vacant at this time)

Action items in italics-

1 Members and role of AC -- Outlined in the UC president's Administrative Policies and Procedures Concerning Organized Research Units , as per 10-130 of UCOPs organizational manual. The most recent copy of the ORU policies and procedures is attached, and posted here: http://policy.ucop.edu/doc/2500488/ORU. See section II.5a.

Advisory Council review and report to the VCR?
Roger is talking with VC for Research about how he wants to handle this.
VC said he sent letters to the Advisory Council about continued participation.
The purpose of this meeting is to prepare for the next calendar year.
Regarding ORU Director Appointment: Members can provide a letter or memo to the Vice Chancellor.

2 Status of SNRI, including staffing & administrative support. Continue as current & seek staff additions, or shift some workload to other units?

SNRI Admin staff need to shift some workload to other units or get additional help. They are working in support of NRS and vehicle management in addition to being the busiest ORU at UC Merced.
Questions about staff support should arise from the annual and 5-year report.
Coty is the MSO
Armando is ED
Three staff and two students:

- grant management for SNRI
- Organize/support all SNRI events
- Handling business for NRS system (needs a full time person)
- Vehicle management for SNRI

Would like to move the NRS to John Jackson – he is declining – because of insufficient staff.
Need to get a staff member dedicated to NRS – either at SNRI or in Office of Research
Should we make a funding request for additional support for SNRI / NRS / EAL /vehicle administrative workload?
Administration of NRS was moved to Research Office
Budget and Finance for NRS has remained with SNRI
There are 9 models for how the NRS is managed in the UC system – each campus is different.
SNRI has such a large volume of grants that even within the UCM campus the SNRI

administrative workload is heavier than other ORUs and departments.

Advisor consensus to ask Sam and John Jackson to have the Office of Research take over the budget/finance soon. SNRI leadership is willing to continue support with the funding support for that position until the administrative workload is transferred to Office of Research.

It is essential that we get that support, SNRI staff is working overtime to keep up right now. They are regularly working at least one weekend day/per week.

We are keeping a record of overtime worked by SNRI admin support staff.

3 SNRI 5-yr review -- Armando compiling data for next AY review. Aim for fall or spring?

2 years late, regarding timing, we will get administrative guidance from Office of Research.
Were we formally notified that we were under review?
Sam said in the Fall that we were to wait for guidelines.
Write a memo to program review and oversight committee and ask them for guidance and suggested timing.
A self study then an external review.
Self Study is expected to be submitted in late fall (targeting early fall).
External Committee picks it up in the Spring and it could take some time (one year?) for that work to be completed.
There is guidance for the academic units that we should adopt.
If we tell "Proc" we want it, they will provide a recommended schedule.
We could say the data is ready in September and report ready in the late fall.
Anthropology is shooting for a September date and it takes a year to get review completed.
Mike Dawson will provide a timeline.
We will provide a memo to PROC asap.
Getting the information from PROC will be helpful in terms of suggested reviewers, external and internal to be provided by SNRI Advisory group.

4 Annual report -- Armando compiling data. Resume this after a 1-yr gap?

David Hosley started annual report a few years ago. This has now changed and the research council wants a report with more metrics.
Report seems to focus on justifying existence of the ORU.
The Annual Report is the place to get the data and compile the information.
Report is due in July 2015. Armando will have draft by early June for review by faculty.
Do we have the cycles to provide an external report next year?
A simpler external report will work with the annual report available for additional detail/information.

5 SNRI Director re-appointment; see attached letter from last year. Request reappointment?

Does Roger want to be re-appointed?, "Yes and No".
Asked for 5 year re-appointment. He was appointed for one year pending the submission of a report.
Will probably get a one-year extension.
Would be good to get a two year reappointment minimum or four year maximum. Will need to be careful of the 10 year appoint limit for ORU Directors.
Kathleen will write a letter to VC Research requesting a formal appointment extension.

6 Participation in Strategic Academic Focusing -- Developing SNRI priorities within the 6 themes (p 6, attached). Level of participation for SNRI? Formulate goals?

Level of participation. Interested in full participation with SNRI backing. Martha was involved during Roger's Sabbatical.
Provide updated Strategic Plan and Business Plan for SNRI.
SNRI can/should be represented at all of the 6 Themes.
How is academic focusing going to play out over the next 6 months ?
This does represent an opportunity for SNRI to develop strength – and develop strength for the campus.
Director would like to carry the flag for Strategic Growth at these meetings.
Within the areas of strategic focusing, there may need to be some triage – if SNRI Directors role is to strengthen SNRI through the most relevant pillars.
SNRI has tried to be an advocate for public health.
We should have a voice – contribute to the conversation with overarching strategic directives that SNRI provides with priorities for the campus and the State.
The furthering of SNRI's sustainability is critical to SNRI's Leadership and we should proceed wisely and cautiously.
We may be better off participating as faculty.
Roger is participating in sustainability and management pillars.
Other ORU's have faculty attending meetings as advocates for their particular ORU.
SNRI being a reasoned voice for strategic growth is important.
We are not saying we want positions – we want to know how we can support the Pillars as SNRI faculty.
Roger gives a gentle nod to participate and represent the view of strategic growth.
After the first group meeting, we should re-group to see how this is working.
Did we offer job to the Environmental Engineering Faculty hire with a spouse hiring?
Are there any other faculty hires coming in?
3 in LES – Asmeret will provide names.
Search for an SNRI position is being led by Tony Westerling.

7 SNRI membership additions & membership committee. Suggestions to reconstitute committee?

Henry Foreman, Mike Dawson and Wolfgang – we need a new chair.
Weigh in on faculty who want to join SNRI?
Wolfgang is willing to stay on.
Mike Dawson will be Chair for Grad Council.
Suggestion that Wolfgang to be asked to Chair? Who will ask?

Need a new member – need suggestions from SNRI leadership.
Andrea Joyce – would be a good person, Kathleen and Mike will help on that.

8 Other items?

SNRI Plan should be reviewed with the 5 year review.
Roger sent out the SNRI Plan 11/12 academic year to all committee members.
Need external ORU committee member name from Sam Traina. (Armando pursing this)

ATTACHMENT: B

SNRI Academic Research Personnel	**SNRI Administrative Personnel**
1. Bales, Roger 2. Birkner, Nancy 3. Booth, Lorenzo 4. Campell, John E. 5 Carper, Dana Lynn 6. Conklin, Martha 7. Flanagan, Jacob, Patrick 8. Frank Carolin 9. Gann, Timothy 10. Hart, Stephen 11. Hilton, Timothy 12. Hull, Kathleen 13. Hunsaker, Carolyn 14. Keyser, Alisa 15. Kupihea, James 16. Lu, Yaqiong 17. Lucas, Ryan 18. Ma, Qin 19. Martin, Sara 20. Miller, Norman 21. O'Day, Peggy 22. Pickard, Michael 23. Reinoso, Maset 24. Rungee, Joseph 25. Safeeq, Mohammad 26. Saska, Philip 27. Thaw, Melissa 28. Vincent, Emmanuel 29. Westerling, Tony 30. Yang, Yetao 31. Yoon, Yeosang 32. Zhao, Tiebiao	1. Campanella, Andrea 2. Galvan, Crystal 3. Meng, Xiande 4. Quintero, Armando 5. Stacy, Erin 6. Valle, Alexis 7. Ventura, Coty 8. Womble, Patrick ***Following list represents students who make up 5 FTE*** *(full time equivalent)* 9. Anderson, Andreas 10. Bradley, Kian 11. Canal, Esther 12. Chi, Asia Con 13. Frise, Andre 14. Iencarelli, Elizabeth 15. Loera, Andrew 16. Martinez, Andrew 17. Shchemelinin, Yoni 18. Torres, Ryan 19. Woodbury, Patrick 20. Zhou, Michelle

Attachment C

Publications – Books, Journal Articles, Reports
Books: 14
Journal Articles: 145
Reports: 4
Press Releases: 30

Faculty Member	Publication
Ardell, David	Burow, D.A., Umeh-Garcia, M.C., True, M.B., Bakhaj, C.D., Ardell, D.H., Cleary, M.D. Dynamic regulation of mRNA decay during neural development (2015) Neural Development, 10 (1), art. no. 11, .
Ardell, David	Amrine, K.C.H., Swingley, W.D., Ardell, D.H. tRNA Signatures Reveal a Polyphyletic Origin of SAR11 Strains among Alphaproteobacteria (2014) PLoS Computational Biology, 10 (2), art. no. e1003454, .
Bales, Roger	Harpold, A.A., Molotch, N.P., Musselman, K.N., Bales, R.C., Kirchner, P.B., Litvak, M., Brooks, P.D. Soil moisture response to snowmelt timing in mixed-conifer subalpine forests (2015) Hydrological Processes, 29 (12), pp. 2782-2798.
Bales, Roger	Bales, R.C., Rice, R., Roy, S.B. Estimated loss of snowpack storage in the Eastern Sierra Nevada with climate warming (2015) Journal of Water Resources Planning and Management, 141 (2), art. no. 04014055, .
Bales, Roger	Kirchner, P.B., Bales, R.C., Molotch, N.P., Flanagan, J., Guo, Q. LiDAR measurement of seasonal snow accumulation along an elevation gradient in the southern Sierra Nevada, California (2014) Hydrology and Earth System Sciences, 18 (10), pp. 4261-4275.
Bales, Roger	Goulden, M.L., Bales, R.C. Mountain runoff vulnerability to increased evapotranspiration with vegetation expansion (2014) Proceedings of the National Academy of Sciences of the United States of America, 111 (39), pp. 14071-14075..
Bales, Roger	Mcconnell, J.R., Maselli, O.J., Sigl, M., Vallelonga, P., Neumann, T., Anschütz, H., Bales, R.C., Curran, M.A.J., Das, S.B., Edwards, R., Kipfstuhl, S., Layman, L., Thomas, E.R. Antarctic-wide array of high-resolution ice core records reveals pervasive lead pollution began in 1889 and persists today (2014) Scientific Reports, 4, art. no. 5848, .
Bales, Roger	Martin, S.E., Conklin, M.H., Bales, R.C. Seasonal accumulation and depletion of local sediment stores of four headwater catchments

	(2014) Water (Switzerland), 6 (7), pp. 2144-2163.
Bales, Roger	Harpold, A.A., Guo, Q., Molotch, N., Brooks, P.D., Bales, R., Fernandez-Diaz, J.C., Musselman, K.N., Swetnam, T.L., Kirchner, P., Meadows, M.W., Flanagan, J., Lucas, R. LiDAR-derived snowpack data sets from mixed conifer forests across the Western United States (2014) Water Resources Research, 50 (3), pp. 2749-2755.
Beman, Michael	Carolan, M.T., Smith, J., Beman, J.M. Transcriptomic evidence for microbial sulfur cycling in the eastern tropical North Pacific oxygen minimum zone (2015) Frontiers in Microbiology, 6 (MAY), art. no. 00334, .
Beman, Michael	Hayden, C.J., Beman, J.M. High abundances of potentially active ammonia-oxidizing bacteria and archaea in oligotrophic, high-altitude lakes of the Sierra Nevada, California, USA (2014) PLoS ONE, 9 (11), art. no. 0111560, .
Beman, Michael	Wilson, J.M., Severson, R., Beman, J.M. Ocean-scale patterns in community respiration rates along continuous transects across the Pacific Ocean (2014) PLoS ONE, 9 (7), art. no. e99821, .
Beman, Michael	Beman, J.M. Activity, Abundance, and Diversity of Nitrifying Archaea and Denitrifying Bacteria in Sediments of a Subtropical Estuary: Bahía del Tóbari, Mexico (2014) Estuaries and Coasts, 37 (6), pp. 1343-1352.
Berhe, Asmeret	Holden, S.R., Berhe, A.A., Treseder, K.K. Decreases in soil moisture and organic matter quality suppress microbial decomposition following a boreal forest fire (2015) Soil Biology and Biochemistry, 87, pp. 1-9.
Berhe, Asmeret	Amundson, R., Berhe, A.A., Hopmans, J.W., Olson, C., Sztein, A.E., Sparks, D.L. Soil and human security in the 21st century (2015) Science, 348 (6235), art. no. 1261071, .
Berhe, Asmeret	Arnold, C., Ghezzehei, T.A., Berhe, A.A. Decomposition of distinct organic matter pools is regulated by moisture status in structured wetland soils (2015) Soil Biology and Biochemistry, 81, pp. 28-37.
Berhe, Asmeret	Kaiser, M., Kleber, M., Berhe, A.A. How air-drying and rewetting modify soil organic matter characteristics: An assessment to improve data interpretation and inference (2015) Soil Biology and Biochemistry, 80, pp. 324-340.
Berhe, Asmeret	Ryals, R., Kaiser, M., Torn, M.S., Asefaw Berhe, A., Silver, W.L. Corrigendum to "Impacts of organic matter amendments on carbon and nitrogen dynamics in grassland soils" [Soil Biol. Biochem. 68 (2014) 52-61] (2014) Soil Biology and Biochemistry, 78, p. 340.

Berhe, Asmeret	Brok, E., Frandsen, C., Madsen, D.E., Jacobsen, H., Birk, J.O., Lefmann, K., Bendix, J., Pedersen, K.S., Boothroyd, C.B., Berhe, A.A., Simeoni, G.G., Mørup, S. Magnetic properties of ultra-small goethite nanoparticles (2014) Journal of Physics D: Applied Physics, 47 (36), art. no. 365003, .
Berhe, Asmeret	Taş, N., Prestat, E., McFarland, J.W., Wickland, K.P., Knight, R., Berhe, A.A., Jorgenson, T., Waldrop, M.P., Jansson, J.K. Impact of fire on active layer and permafrost microbial communities and metagenomes in an upland Alaskan boreal forest (2014) ISME Journal, 8 (9), pp. 1904-1919.
Berhe, Asmeret	Ryals, R., Kaiser, M., Torn, M.S., Berhe, A.A., Silver, W.L. Impacts of organic matter amendments on carbon and nitrogen dynamics in grassland soils (2014) Soil Biology and Biochemistry, 68, pp. 52-61. Cited 7 times.
Berhe, Asmeret	Arnold, C., Ghezzehei, T.A., Berhe, A.A. Early spring, severe frost events, and drought induce rapid carbon loss in high elevation meadows (2014) PloS one, 9 (9), p. e106058.
Berhe, Asmeret	Kaiser, M., Ghezzehei, T.A., Kleber, M., Myrold, D.D., Berhe, A.A. Influence of calcium carbonate and charcoal applications on organic matter storage in silt-sized aggregates formed during a microcosm experiment (2014) Soil Science Society of America Journal, 78 (5), pp. 1624-1631.
Berhe, Asmeret	Kaiser, M., Asefaw Berhe, A. How does sonication affect the mineral and organic constituents of soil aggregates? - A review (2014) Journal of Plant Nutrition and Soil Science, 177 (4), pp. 479-495.
Blois, Jessica	Jackson, S.T., Blois, J.L. Community ecology in a changing environment: Perspectives from the Quaternary (2015) Proceedings of the National Academy of Sciences of the United States of America, 112 (16), pp. 4915-4921.
Blois, Jessica	Nieto-Lugilde, D., Maguire, K.C., Blois, J.L., Williams, J.W., Fitzpatrick, M.C. Close agreement between pollen-based and forest inventory-based models of vegetation turnover (2015) Global Ecology and Biogeography, 24 (8), pp. 905-916.
Blois, Jessica	Gill, J.L., Blois, J.L., Benito, B., Dobrowski, S., Hunter, M.L., Jr., Mcguire, J.L. A 2.5-million-year perspective on coarse-filter strategies for conserving nature's stage (2015) Conservation Biology, 29 (3), pp. 640-648.
Blois, Jessica	Blois, J.L., Gotelli, N.J., Behrensmeyer, A.K., Faith, J.T., Lyons, S.K., Williams, J.W., Amatangelo, K.L., Bercovici, A., Du, A., Eronen, J.T., Graves, G.R., Jud, N., Labandeira, C., Looy, C.V., Mcgill, B., Patterson, D., Potts, R., Riddle, B., Terry, R., Tóth, A., Villaseñor, A., Wing, S. A framework for evaluating the influence of climate, dispersal limitation, and biotic interactions using fossil pollen associations across the late

	Quaternary (2014) Ecography, . Article in Press.
Blois, Jessica	Gavin, D.G., Fitzpatrick, M.C., Gugger, P.F., Heath, K.D., Rodríguez-Sánchez, F., Dobrowski, S.Z., Hampe, A., Hu, F.S., Ashcroft, M.B., Bartlein, P.J., Blois, J.L., Carstens, B.C., Davis, E.B., de Lafontaine, G., Edwards, M.E., Fernandez, M., Henne, P.D., Herring, E.M., Holden, Z.A., Kong, W.-seok., Liu, J., Magri, D., Matzke, N.J., Mcglone, M.S., Saltré, F., Stigall, A.L., Tsai, Y.-H.E., Williams, J.W. Climate refugia: Joint inference from fossil records, species distribution models and phylogeography (2014) New Phytologist, 204 (1), pp. 37-54. Cited 15 times.
Campbell, Elliott	Campbell, J.E., Whelan, M.E., Seibt, U., Smith, S.J., Berry, J.A., Hilton, T.W. Atmospheric carbonyl sulfide sources from anthropogenic activity: Implications for carbon cycle constraints (2015) Geophysical Research Letters, 42 (8), pp. 3004-3010.
Campbell, Elliott	Zumkehr, A., Campbell, J.E. The potential for local croplands to meet US food demand (2015) Frontiers in Ecology and the Environment, 13 (5), pp. 244-248.
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Attachments D– next page (page 42-44)

Appropriation ItD	Expenditures ItD	Appropriation Fiscal Year 14-15	Expenditures Fiscal Year 14-15	Award Amount	PI Last Na	PI First Na	Project	Sponsor	Award Title
1,705,280.00	1,608,675.94	355,029.81	258,425.75	1,985,280.00	Bales	Roger	AMR (Fab 100010	NSF	instrument cluster for hydrologic, atmospheric and ecosystem science
238,436.00	89,963.29	197,339.86	48,867.15	222,213.00	Bales	Roger	STEF (PINECREST)	USDA Forest Service	Variable Thinning Using Historical Stand Structure Data to Create Fire-resilient Forests an Enhance
112,500.00	98,901.63	30,923.30	17,324.93	77,500.00	Bales	Roger	KREW	USDA Forest Service	Watershed Function & Effects from Forest Restoration: Kings River Experimental Watershed & Critical Zone Observatory
45,921.36	5,716.14	45,921.36	5,716.14	121,841.00	Bales	Roger	SWEEP2/ANR	UC ANR	Effects of Forest Management on Water Yiends and Other Ecosystem Services in Sierra Nevada Forests
25,280.48	24,477.39	25,280.48	24,477.39	43,887.00	Bales	Roger	CITRIS	CITRIS	CITRIS Seed Funding: Quantifying the Value of Hydrologic Forecasting for Intelligent Hydropower Operations
672,631.80	481,298.66	475,692.81	284,359.67	5,122,740.00	Bales	Roger	PIMRB	NSF	Southern Sierra Critical Zone Observatory
53,041.00	13,537.63	53,041.00	13,537.63		Bales	Roger	RESRB	NSF	Southern Sierra Critical Zone Observatory
264,381.00	112,648.11	215,878.94	64,146.05		Bales	Roger	CORE/MAIN	NSF	Southern Sierra Critical Zone Observatory
150,000.00	68,369.24	148,389.58	66,758.82	150,000.00	Bales	Roger	-	USDA Forest Service	Climate and Landscape-Change Effects Research on Water Quantity and Quality of Forests in Sierra Nevada (and Comparative Areas)
17,488.00	17,488.00	17,488.00	17,488.00		Bales	Roger	Financial Aid Acct	NSF	Southern Sierra Critical Zone Observatory
12,445.00	7,674.70	12,455.00	7,674.70		Bales	Roger	Overhead Varianc	NSF	Southern Sierra Critical Zone Observatory
200,064.00	168,715.61	200,064.00	168,715.61		Bales	Roger	articipant Suppor	NSF	Southern Sierra Critical Zone Observatory
599,334.00	5,461.00	599,334.00	5,461.00	3,529,750.00	Bales	Roger	WASSRI	UCOP	UC Water Security and Sustainability Research Initiative
67,194.45	28,193.01	67,194.45	28,193.01	34,665.00	Bales	Roger	Chasing Snow	The Yosemite Foundation	Chasing Snow: How Will Changing Snow Affect Yosemite's Resources
6,820.00	-	6,820.00	-		Berhe	Asmeret	UCM-A	NSF	Southern Sierra Critical Zone Observatory
266,582.93	95,691.12	266,582.93	95,691.12	314,504.00	Campbell	Elliot	-	UC Lab Fees Research Program	Quantifiying Urban CO2 fluxes using carbonyl sulfide and 14C
249,277.00	201,166.50	148.888.04	100,777.54	249,277.00	Campbell	Elliot	AFRI	University of Missouri (USDA prime)	Farmer Adaptation to Climate-Induced Yield Changes and Market Impacts
367,645.68	36,354.20	367,645.68	36,654.20	1,045,721.00	Campbell	Elliot	DOE-Brazil	US Department of Energy DC	Scaling from Flux Towers to Ecosystem Models: Regional constraints on Carbon Cycle Processes from
21,790.00	-	21,790.00	-	25,846.00	Campbell	Elliot			
4,056.00	4,056.00	4,056.00	4,056.00		Campbell	Elliot			
48,921.03	27,318.60	48,921.03	27,318.60	144,410.00	Chen	YangQuan	ANR-UAV	UC-ANR	Rotor Unmanned Aerial Vehicles (UAV's) as a Crop Monitoring Tool
55,674.20	39,609.40	55,674.20	36,609.40		Conklin	Martha	UCM-C	NSF	Southern Sierra Critical Zone Observatory
225,420.00	76,272.11	225,158.56	76,010.67		Conklin	Martha	CZO-E&O	NSF	Southern Sierra Critical Zone Observatory
200,485.00	187.786.27	82,813.60	70,114.87	200,485.00	Conklin	Martha	USDA-SNAMP (TO12)	UC Berkeley (USDA prime)	Sierra Nevada Adaptive Management Program
36,785.55	36,785.55	(37,311.45)	(37,311.45)	165,000.00	Conklin	Martha	TASK19	DWR	Sierra Nevada Adaptive Management Program, Merced-Task Order 19
284,501.45	139,744.49	284,501.45	139,744.49	163,556.00	Conklin	Martha			
68,423.00	-	68,423.00	-	268,423.00	Conklin	Martha			
100,000.00	-	100,000.00	-		Conklin	Martha			
100,000.00	-	100,000.00	-		Conklin	Martha			
27,857.00	-	27,857.00	-	161,999.00	Conklin	Martha			
130,753.00	3,624.36	130,753.00	3,624.36		Conklin	Martha			
149,950.33	149,950.33	130,735.09	130,735.09		Frank	Carolin	EAGER	NSF	EAGER: Nitrogen Fixing Bacterial Endosymbioses in Above Ground Conifer Tissue
1,429,949.00	111,511.80	1,429,949.00	111,511.80	1,623,786.00	Frank	Carolin	DIMENSIONS	NSF	Dimensions: Taxonomic, genetic, and functional biodiversity of above-ground bacterial endophytes in subalpine conifers
189,609.00	184,874.13	34,931.41	30,196.54	57,449.00	Guo	Qinghua	SNAMP	UC Berkeley (USDA prime)	Sierra Nevada Adaptive Management Program
265,854.00	80,314.87	265,854.00	80,314.87	265,854.00	Guo	Qinghua	Forest3D	NSF	ABI Development: Forest3D - An Open Source Platform for Lidar Applications in Forestry
38,409.00	29,290.23	38,409.00	29,290.23	38,408.76	Guo	Qinghua	DOQQs	USDA Forest Service	Using LiDAR and DOQQs to Map Forest Vegetation for Assessing Wildlife Habitat
38,038.00	31,909.49	26,536.31	20,407.80		Hart	Stephen	UCM-H	NSF	Southern Sierra Critical Zone Observatory
66,532.00	57,936.97	30,191.55	21,596.52	318,150.00	Hart	Stephen	REU	NSF	REU Site: Yosemite Environmental Science Research Training
232,218.00	164,252.90	159,879.47	91,914.37		Hart	Stephen	REU	NSF	REU Site: Yosemite Environmental Science Research Training
19,400.00	20,650.00	-	1,250.00		Hart	Stephen	REU	NSF	REU Site: Yosemite Environmental Science Research Training
200,000.00	154,163.22	45,836.78	-	600,000.00	Hosley	David	-	USDI	National Parks Insitute
					Hosley	David	-	-	National Parks Insitute - Program Income Acct
89,363.00	78,722.20	24,484.97	13,844.17	89,363.00	Hull	Kathleen	NAGPRA	USDI	El Portal NAGPRA Project
34,569.00	27,955.13	33,390.48	26,776.61	34,569.00	Hull	Kathleen	-	NPS	Research and Reporting for Yosemite Archeological Collections
37,745.00	37,681.84	37,745.00	37,681.84	37,745.00	Jepsen	Steven	-	UC ANR	Lake-Pair Synchronicity as an Indicator of Permafrost Change in Arctic Regions
15,000.00	2,428.11	15,000.00	2,428.11	15,000.00			Pistachio	ornia Pistachio Research Bo	Molecular identification of leaffooted plant bug and stink bug species and strains in pistachio orchards
25,563.00	24,566.58	13,825.52	12,829.10	17,555.00	Joyce	Andrea	-	Mosquito Research Foundation	Population genetic structure of the Culex pipiens complex in Merced County
2,800.83	-	2,800.83	-	11,650.00	Joyce	Andrea	-	UCOP	Behavioral insights to Understand Genetic Isolation in a Maize Pest, the leafopper Dalbulus Maidis
35,416.00	24,460.88	35,416.00	24,460.88	35,439.00	Joyce	Andrea	14.ENTO8.Joyce	Almond Board of California	Early Detection of Leaffooted Plant Bug in Almond Orchards
39,957.44	39,957.44	12,318.81	12,318.81	36,959.00	Joyce	Andrea	13.ENTO8.Joyce	Almond Board of California	Early Detection of Leaffooted Plant Bug in Almond Orchards
2,043,562.00	2,037,879.66	137.38	(5,544.96)	4,995,279.00	Kueppers	Lara	-	DOE	Sup Alpine Species Range Shifts with Climate Change: temperature and soil moisture manipulations to test species and population responses
536,700.00	536,561.87	380.10	241.97		Kueppers	Lara	-	DOE	Sup Alpine Species Range Shifts with Climate Change: temperature and soil moisture manipulations to test species and population responses (Overhead Variance)
1,081,711.00	887,081.39	460,440.17	265,810.56		Kueppers	Lara	-	DOE	Sup Alpine Species Range Shifts with Climate Change: temperature and soil moisture manipulations to test species and population responses
47,151.00	46,919.80	12,158.37	11,927.17	72,153.00	Miller	Norman	-	UCB (NSF prime)	CNH: Wetland Persistence in a Working Landscape: Links between Landowner Decisions, Climate, Disease, Ecology, and Metapopulation Dynamics
73,523.00	58,549.16	58,050.28	43,076.44	73,523.00	Miller	Norman	-	NASA	Evaluation of Impacts of Climate Variability and Change at NASA Ames Research Center
691,296.46	691,296.46	46,697.04	46,697.04	781,992.00	O'Day	Peggy	-	DOE	Molecular Mechanisms and Kinetics of Microbial Anerobic, Nitrate-Dependent U(IV) and Fe(II) Oxidation
300,000.00	209,984.33	206,341.83	116,290.16	300,000.00	O'Day	Peggy	-	NSF	Collaborative Research: Quantifying the Reactive Surface Area of Environmental Solids
42,327.00	52,596.85	42,327.00	52,596.85	42,327.00	O'Day	Peggy	NIH-RS6	USC (NIH prime)	Human Models of the Nanoparticulate-Induced Inflammatory/Antioxidant Axis in Aging
300,126.00	252,464.11	143,918.41	96,256.52	300,126.00	O'Day	Peggy	-	DOE	Uranium and Strontium Fate in Waste-Weathered Sediments: Scaling of Molecular Processes to Predict Reactive Transport
112,607.00	2,615.41	112,607.00	2,615.41	112,607.00	O'Day	Peggy			
				69,252.00	Rice	Robert			
100,000.00	13,826.86	100,000.00	13,826.86	100,000.00	Rolland	Erik	RLF	Resources Legacy Fund	Development and Implementation of the California State Parks Institute
35,000.00	8,832.92	35,000.00	8,832.92	35,000.00	Viers	Joshua	Vollmar	Ilmar Natural Land Consulti	Assessment of Conservation Status of Vernal Pool Habitat in the Central Valley
60,197.00	44,106.53	36,925.22	20,834.75	60,197.00	Westerling	Anthony	-	UCSD (NSF Prime)	Multiscale Modeling of Aerosol Indiret Effects on Decadal Timescales
220,000.00	167,175.60	92,963.98	40,139.58	275,000.00	Westerling	Anthony	CNAP	UCSD (NOAA Prime)	California Nevada Applications Program
121,978.00	121,980.48	(253.64)	(251.16)	275,000.00	Westerling	Anthony	USDA-AFRI	Penn State	Projecting Climate Change Mitigation and Adaptation in Fire-Prone Forests Under Future Climate Change
153,022.00	24,935.89	153,022.00	24,935.89		Westerling	Anthony	USDA-AFRI	Penn State	Projecting Climate Change Mitigation and Adaptation in Fire-Prone Forests Under Future Climate Change (new FAU opened; fund 25202 was given erroneous series)
75,000.00	55,775.39	72,021.83	52,797.22	75,000.00	Westerling	Anthony		USDA Forest Service	Modeling Potential Fire, Emissions, Suppression Costs, and WUI Impacts with Different Landscape Vegetation Scenarios under Changing Climate
38,409.00	29,290.23				Guo	Qinghua	DOQQs	USDA Forest Service	Using LiDAR and DOQQs to Map Forest Vegetation for Assessing Wildlife Habitat
					Rolland	Erik	DPR	artment of Parks and Recre	The UC Merced California State Parks Institute
		FY 14-15		Award Total					
15,301,971.99	9,854,241.74	8,107,758.78	$ 3,003,075.61	24,776,480.76					

Expenditure Sub-Object Summary As of June 30, 2015

Account/CC: 449001/2A RESEARCH-SNRI-OPERATIONS Fund : 19900 GENERAL FUNDS

Sub-Object	Description	Expenditure	Encumbrance ()=CREDIT	
00-0000	SALARIES-ACADEMIC-UNDESIGNATED BALANCES			
00-1050	S&W-ACADEMIC ADMINISTRATIVE	40377.96		
00-1070	S&W-APPRENTICE RESEARCH	13758.34		
00-1888	ACADEMIC SALARIES-DEFAULT	20137.50		
00 Academic Salaries**		**74273.80**	**0.00**	74273.80
01-0000	SALARIES-STAFF-UNDESIGNATED BALANCES			
01-1110	S&W-MGMT/CAREER STAFF	207904.26		
01-1940	ACCRUED S & W COSTS	385.60		
01 Staff - Career**		**208289.86**	**0.00**	208289.86
02-0000	GENERAL ASSISTANCE-UNDESIGNATED BALANCES			
02-1120	S&W-CAREER STAFF SUB 2	2000.00		
02-1130	S&W-CASUAL STAFF	24929.10		
02-1140	S&W-WORK-STUDY	1098.65		
02-1940	ACCRUED S & W COSTS	850.62		
02 Limited Appts - Students**		**28878.37**	**0.00**	28878.37
03-0000	SUPPLIES & EXPENSE-UNDESIGNATED BALANCES			
03-2040	CONFERENCE REG FEES/IN-STATE TRAVEL	1531.00		
03-2045	CONFERENCE REG FEES/OUT-OF-STATE TRA	480.00		
03-3003	FREIGHT AND SHIPPING-OUTGOING	387.75	6.24	
03-3195	MISCELLANEOUS FACILITIES SERVICES	1656.21		
03-3210	ADVERTISING-RECRUITMENT/PROCUREMENT			
03-3214	PROMOTIONAL MATERIALS & SERVICES	1192.80	332.77	
03-3265	COMPUTING NETWORK SERVICES	198.00		
03-3284	CUSTODIAL SERVICES (RECHARGE)	28.26		
03-3308	ENTERTAINMENT-FOOD & BEVERAGE	640.57		
03-3310	FOOD & BEVERAGE, BUSINESS CONFER & MT	1846.31		
03-3321	EVENT COORDINATION (RECHARGE)	295.00		
03-3380	INSURANCE	3029.15		
03-3464	PARKING SERVICES (RECHARGE)	280.00		
03-4001	TELEPHONE TOLLS	4233.66		
03-4003	TELEPHONE-OTHER	53.11		
03-4070	OUTGOING MAIL CHARGES	56.42		
03-4380	COMPUTING SUPPLIES OR HARDWARE (<$20	326.71		
03-4410	CUSTODIAL/CLEANING SUPPLIES	13.31		
03-4460	ELECT. SUPPLIES OR COMPONENTS	11.64		
03-4505	FOOD	218.31		
03-4525	FURNITURE & FIXTURES (NON-INVENTORIAL)	2469.15		
03-4630	LAB/SHOP INSTRUMENTS AND SUPPLIES	6581.12		
03-4700	OFFICE SUPPLIES	2933.22	2544.18	
03-4715	PAPER/PLASTIC SUPPLIES - NON-OFFICE	18.38		
03-4771	PROJECT SPECIFIC OFFICE TYPE SUPPLIES			
03-5210	UTILITIES-ELECTRICITY		19.21	
03-5805	SPACE RENTAL/LEASE ON-CAMPUS	20.00		
03-6010	PRINTING OF OFFICE SUPPLIES	34.94	28.49	
03-6030	COPYING SERVICES	0.07		
03-6605	COMP SOFTWARE LICENSE/RENTAL FEES	217.32		
03-9100	THEFT SENS EQUIP $200-4999-COMP HARDW	7151.84		
03 General Operations**		**35904.25**	**2930.89**	38835.14
05-0000	SPECIAL ITEMS-UNDESIGNATED BALANCES			
05-1060	S&W-PROFESSIONAL RESEARCH	15.56		
05-2000	TRAVEL-IN-STATE AND DOMESTIC	13225.98	209.52	
05-2020	PARKING	247.25		
05-2025	VEHICLE RENTAL-TRAVEL	561.64		
05-2040	CONFERENCE REG FEES/IN-STATE TRAVEL	395.00		
05-2045	CONFERENCE REG FEES/OUT-OF-STATE TRA	2505.00		
05-2100	TRAVEL-CONFERENCES FEES	50.00		
05-2700	RELOCATION EXPENSE	504.54		
05-3310	FOOD & BEVERAGE, BUSINESS CONFER & MT	69.67	11.48	
05-3456	PROFESSIONAL SERVICES/UNIVERSITY	147.09		
05 Travel**		**17721.73**	**221.00**	17942.73
06-0000	EMPLOYEE BENEFITS-UNDESIGNATED BALANCES			
06-8543	CORE MEDICAL-STAFF CASUAL	659.78		
06-8563	CORE LIFE-STAFF CASUAL	1.41		
06-8710	DENTAL INSURANCE-PSBP	144.48		
06-8720	HEALTH INSURANCE-PSBP	1974.31		
06-8730	VISION INSURANCE-PSBP	49.60		
06-8741	DISABILITY INSURANCE-PSBP	24.50		
06-8751	LIFE INSURANCE-PSBP	7.85		
06-8761	BROKER FEES-PSBP	24.55		
06-8940	ACCRUED BENEFITS COSTS	141.03		
06-8291	BENEFITS FOR ACADEMICS	20339.83		
06-8292	BENEFITS FOR STAFF CAREER	85842.40		
06-8293	BENEFITS FOR STAFF CASUAL	377.26		
06 Benefits**		**109587.00**	**0.00**	109587.00
07-0000	SPECIAL ITEMS-UNDESIGNATED BALANCES			
07-3003	FREIGHT AND SHIPPING-OUTGOING	51.45		
07-3105	MAINT/SVC AGREEMENT-COMPUTER SOFTW	90.91		
07-3160	REPAIRS-OTHER EQUIP	232.10		
07-3195	MISCELLANEOUS FACILITIES SERVICES	139.06		
07-3308	ENTERTAINMENT-FOOD & BEVERAGE	1137.00		
07-3310	FOOD & BEVERAGE, BUSINESS CONFER & MT	2442.73		
07-3410	LAUNDRY SERVICES	64.00		
07-3425	MEMBERSHIPS, BUSINESS AND PROFESSION	1000.00	100.00	
07-3464	PARKING SERVICES (RECHARGE)	200.00		
07-4003	TELEPHONE-OTHER	96.78		
07-4318	AUDIO SUPPLIES	39.94		
07-4380	COMPUTING SUPPLIES OR HARDWARE (<$20	12.42		
07-4410	CUSTODIAL/CLEANING SUPPLIES	24.76		
07-4460	ELECT. SUPPLIES OR COMPONENTS	7.22		

07-4630	LAB/SHOP INSTRUMENTS AND SUPPLIES		4955.38	
07-4700	OFFICE SUPPLIES	1306.14		
07-4706	PACKAGING/CONTAINERS/ADHESIVES	12.65		
07-5810	FACILITY RENTAL-SHORT TERM	2636.00		
07-6020	ART/PHOTO SERVICES	35.00		
07-6030	COPYING SERVICES	58.92		
07-6200	BOOKS & MAPS FOR DEPT USE	74.50		
07 Other Expenses**		**9661.58**	**5055.38**	14716.96
				492523.86

Attachment E

Gifts Administered through Development and Alumni Relations

Donor Name	**Gift Amount**	**Fund Description**
The Yosemite Foundation	$36,066.00	Chasing Snow Project
Mitsubishi CFA	$46,835.00	Support to Undergraduate Students to Work as Naturalists
Gary Kremen	$3,000.00	Sierra Nevada Research Institute Fund
Roger C. Bales	$5,000.00	Sierra Nevada Research Institute Fund
Stephen W. Ho	$10.00	Sierra Nevada Research Institute Fund
Emmanuel Vincent	$1,600.00	Sierra Nevada Research Institute - Climate Feedback
Evan Evans	$250.00	Sierra Nevada Research Institute - Climate Feedback
ANCHOR QEA, LLC	$10,000.00	Sierra Nevada Research Institute – O'Day – Geochemistry
Edison International (SCE)	$50,000.00	SCE STEM Fellowships for Graduate Students
	$152,761.00	

This is the last page of the SNRI Annual report for 2014/15

SNRI Awards for FY 2010/11

fund_title	fund_beg_date	fund_end_date	sponsor_name	pi_name	Award Amount
DWR MONITOR CLIMATE BALES 05/13 0%	7/15/10 0:00	5/31/13 0:00	CA/DEPARTMENT OF WATER RESOURCES	BALES, ROGER C	$362,709
MICROLINK SOLAR SHEETS WINSTON 5/12 52%	7/20/10 0:00	5/19/12 0:00	MICROLINK DEVICES, INC.	WINSTON, ROLAND	$201,407
U OF ILLINOIS NSF IGERT LEPPERT 07/16 8%	8/1/10 0:00	7/31/16 0:00	UNIVERSITY OF ILLINOIS	LEPPERT, VALERIE J	$427,699
DOE NITRATE DEPENDENT O'DAY 11/14 52%	8/1/10 0:00	11/30/14 0:00	DOE-DEPARTMENT OF ENERGY WASHINGTON D.C.	O'DAY, PEGGY A	$781,956
USDA MEADOW HYDROLOGY CONKLIN 3/14 0%	8/2/10 0:00	3/14/14 0:00	DOA-DEPARTMENT OF AGRICULTURE MISCELLANEOUS AGENCIES	CONKLIN, MARTHA H	$273,411
USD I VEGETATION TRANS GUO 9/14 17.5%	8/6/10 0:00	9/30/14 0:00	DOI-DEPARTMENT OF THE INTERIOR	GUO, QINGHUA	$54,333
USDI DIVERSE SOIL TYPE AGUILAR 1/12 25%	8/25/10 0:00	1/31/12 0:00	DOI-DEPARTMENT OF THE INTERIOR	AGUILAR, ANDRES	$11,000
NSF ARCTIC SEA ICE BURKHART 8/14 52%	9/1/10 0:00	8/31/14 0:00	NATIONAL SCIENCE FOUNDATION	BURKHART, JOHN F	$92,411
UCSD NEVADA APP PRG WESTERLING 8/12 52%	9/1/10 0:00	8/31/12 0:00	DOC-DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC	WESTERLING, ANTHONY	$39,191
NSF YOSEMITE NAT'L PARK GUO 8/12 52%	9/1/10 0:00	8/31/12 0:00	NATIONAL SCIENCE FOUNDATION	GUO, QINGHUA	$12,000
CAS CLIMATE CHANGE DAWSON 08/10 0%	9/1/10 0:00	8/31/11 0:00	CALIFORNIA ACADEMY OF SCIENCES	DAWSON, MICHAEL	$43,546
USDA KINGS RIVER BALES 12/10 26%	9/16/10 0:00	12/31/10 0:00	DOA-DEPARTMENT OF AGRICULTURE MISCELLANEOUS AGENCIES	BALES, ROGER C	$19,857
TIU PUBLIC LANDS TRAINA 12/11 8%	9/21/10 0:00	12/31/11 0:00	INDIANA UNIVERSITY	TRAINA, SAMUEL J	$5,000
OHIO STATE RHIZOSPHRE GHEZZEHEI 9/15 52%	10/1/10 0:00	9/30/15 0:00	OHIO STATE UNIVERSITY	GHEZZEHEI, TEAMRAT	$217,440
NSF NO:OIA 0963544 WAWONA FIELD ST.REST	10/1/10 0:00	3/31/13 0:00	NATIONAL SCIENCE FOUNDATION	BALES, ROGER C	$0
NSF/ARRA WAWONA FIELD BERLOW 3/13 0%	10/1/10 0:00	3/31/13 0:00	NATIONAL SCIENCE FOUNDATION	BALES, ROGER C	$385,083
NASA GROWING ALGAE CAMPBELL 11/11 0%	11/1/10 0:00	11/28/11 0:00	NASA-GODDARD SPACE FLIGHT CENTER	CAMPBELL, J. ELLIOT	$28,000
TANSLEY FAIRY SHRIMP AGUILAR 1/11 52%	11/1/10 0:00	1/1/11 0:00	TANSLEY TEAM INC.	AGUILAR, ANDRES	$2,696
NSF ONCHIDIID SLUGS DAYRAT 1/14 52%	2/1/11 0:00	1/31/14 0:00	NATIONAL SCIENCE FOUNDATION	DAYRAT, BENOIT A	$486,346
ARMY CORP SOUTH KOREA CHEN 6/11 52%	2/10/11 0:00	6/30/11 0:00	DA-ARMY ENGINEERS/VICKSBURG DISTRICT, CORPS OF	CHEN, YIHSHI	$6,998
CIEE ALGAE BIOFUELS CAMPBELL 12/11 20%	4/13/11 0:00	12/31/11 0:00	CA/ RA ENERGY RESOURCES, CONSERVATION DEVELOPMENT COMMISSION	CAMPBELL, J. ELLIOT	$92,751
SJV AIR QUALITY FELLOWSHP FORMAN 6/14 0%	5/19/11 0:00	6/30/14 0:00	SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT	FORMAN, HENRY J	$50,000
			UC solar		$ 727,000
				Total FY 10/11 Awards	$4,320,834

SNRI Awards for FY 2011/12

fund_title	fund_beg_date	fund_end_date	sponsor_name	pi_name	Award Amount
USGS TREE LINE ECOSYSTEM GUO 06/14 17.5%	7/20/11 0:00	6/30/14 0:00	DOJ-DEPARTMENT OF JUSTICE FEDERAL BUREAU OF INVESTIGATION	GUO, QINGHUA	$67,790
UCSD CAL-NEV CNAP WESTERLING 8/16 55%	9/1/11 0:00	8/31/16 0:00	DOC-DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC	WESTERLING, ANTHONY	$220,000
NSF COLLABORATVE RSRCH BURKHART 8/16 26%	9/1/11 0:00	8/31/16 0:00	NATIONAL SCIENCE FOUNDATION	BURKHART, JOHN F	$127,052
UCB/USDI SEQUOIA MOISTURE GUO 1/13 17.5%	9/1/11 0:00	1/29/13 0:00	DOI-DEPARTMENT OF THE INTERIOR	GUO, QINGHUA	$37,079
CAS FORECASTING CLIMATE DAWSON 08/12 0%	9/1/11 0:00	8/31/12 0:00	CALIFORNIA ACADEMY OF SCIENCES	DAWSON, MICHAEL	$33,140
DOE WASTE WEATHERED O'DAY 11/15 55%	9/15/11 0:00	11/30/15 0:00	DOE-DEPARTMENT OF ENERGY WASHINGTON D.C.	O'DAY, PEGGY A	$300,126
USDE CARBONYL SULFIDE CAMPBELL 12/12 52%	9/15/11 0:00	12/31/12 0:00	DOE-DEPARTMENT OF ENERGY WASHINGTON D.C.	CAMPBELL, J. ELLIOT	$149,849
UCCSN DARK MATTER ARDELL 8/14 55%	9/26/11 0:00	8/25/14 0:00	UNIVERSITY AND COMMUNITY COLLEGE SYSTEM OF NEVADA (INCL UNLV	ARDELL, DAVID	$20,265
USFS LIGHTNING STRIKES WESTERLING 7/13	9/28/11 0:00	7/20/13 0:00	DOA-DEPARTMENT OF AGRICULTURE MISCELLANEOUS AGENCIES	WESTERLING, ANTHONY	$5,000
NSF MRI ECOSYSTEM BALES 9/15 52%	10/1/11 0:00	9/30/15 0:00	NATIONAL SCIENCE FOUNDATION	BALES, ROGER C	$1,985,280
SIGMA XI BAUMSTEIGER-AGUILAR	1/1/12 0:00	12/31/12 0:00	SIGMA XI, THE SCIENTIFIC RESEARCH SOCIETY	AGUILAR, ANDRES	$868
DWR ADAPTIVE MANAGEMENT CONKLIN 5/14 0%	3/1/12 0:00	5/31/14 0:00	CA/DEPARTMENT OF WATER RESOURCES	CONKLIN, MARTHA H	$150,000
UCSD/NSF AEROSOL WESTERLING 3/16 55%	4/1/12 0:00	3/31/16 0:00	NATIONAL SCIENCE FOUNDATION	WESTERLING, ANTHONY	$60,197
SOUND SC CLIMATE CHANGE KUEPPERS 8/13 0%	5/12/12 0:00	8/16/13 0:00	SOUND SCIENCE LLC	KUEPPERS, LARA	$53,263
			UC solar		$ 727,000
				Total FY 11/12 Awards	$3,936,908

SNRI Awards for FY 2012/13

fund_title	fund_beg_date	fund_end_date	sponsor_name	pi_name	Award Amount
UCB/NSF WETLAND PERSIST MILLER 8/15 26%	7/1/12 0:00	8/31/15 0:00	NATIONAL SCIENCE FOUNDATION	MILLER, NORMAN	$47,151
NSF SOIL ORGANIC MATTER BERHE 6/15 55%	7/1/12 0:00	6/30/15 0:00	NATIONAL SCIENCE FOUNDATION	BERHE, ASMERET ASEFAW	$75,000
VIRGIN ISLANDS CORAL TRAINA 12/14 25%	7/1/12 0:00	12/31/14 0:00	DOC-DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC	TRAINA, SAMUEL J	$28,247
LBNL INTRA-UNIVERSITY KUEPPERS 9/13 26%	7/1/12 0:00	9/30/13 0:00	LAWRENCE LIVERMORE NATIONAL SECURITY, LLC	KUEPPERS, LARA	$181,597
NSF RAPID INVERTEBRATE DAWSON 06/14 55%	7/15/12 0:00	6/30/14 0:00	NATIONAL SCIENCE FOUNDATION	DAWSON, MICHAEL	$66,910
USDA FIRE RESILIENT BALES 05/16 0%	7/17/12 0:00	5/31/16 0:00	DOA-DEPARTMENT OF AGRICULTURE MISCELLANEOUS AGENCIES	BALES, ROGER C	$238,436
NSF ANTHROPOGENIC HARMON 08/16 55%	9/1/12 0:00	8/31/16 0:00	NATIONAL SCIENCE FOUNDATION	HARMON, THOMAS C	$1,495,548
PENN ST CLIMATE CHNG WESTERLING 8/16 43%	9/1/12 0:00	8/31/16 0:00	DOA-DEPARTMENT OF AGRICULTURE NATIONAL INSTITUTE FOR FOOD AN	WESTERLING, ANTHONY	$121,978
U MISSOURI MKT IMPACT CAMPBELL 8/16 43%	9/1/12 0:00	8/31/16 0:00	UNIVERSITY OF MISSOURI SYSTEM (COLUMBIA/KANSAS CITY/ROLLA/ST	CAMPBELL, J. ELLIOT	$249,277
PENN CLIMATE CHNG WESTERLING 8/16 42.86%	9/1/12 0:00	8/31/16 0:00	PENNSYLVANIA STATE UNIVERSITY	WESTERLING, ANTHONY	$153,022
NPS EL PORTAL NAGPRA HULL 12/15 17.5%	9/1/12 0:00	12/31/15 0:00	DOI-DEPARTMENT OF THE INTERIOR	HULL, KATHLEEN L.	$89,363
UCB/USDA ADAPTIVE MGMT CONKLIN 09/15 0%	9/1/12 0:00	9/15/15 0:00	DOA-DEPARTMENT OF AGRICULTURE FOREST SERVICE	CONKLIN, MARTHA H	$200,485
UCB/USDA ADAPTIVE MGMT GUO 09/15 0%	9/1/12 0:00	9/15/15 0:00	DOA-DEPARTMENT OF AGRICULTURE FOREST SERVICE	GUO, QINGHUA	$189,609
MOSQUITO CULEX PIPIENS JOYCE 06/15 0%	9/1/12 0:00	6/30/15 0:00	MOSQUITO RESEARCH FOUNDATION	JOYCE, ANDREA	$18,008
NSF CZO CRITICAL ZONE BALES 08/14 55%	9/1/12 0:00	8/31/14 0:00	NATIONAL SCIENCE FOUNDATION	BALES, ROGER C	$999,226
USDA CZO KINGS RIVER BALES 09/16 0%	9/12/12 0:00	9/30/16 0:00	DOA-DEPARTMENT OF AGRICULTURE MISCELLANEOUS AGENCIES	BALES, ROGER C	$112,500
NSF REACTIVE SURFACE O'DAY 8/16 55%	9/15/12 0:00	8/31/16 0:00	NATIONAL SCIENCE FOUNDATION	O'DAY, PEGGY A	$300,000
NSF MICROBIAL CUES TRAINA 09/14 26%	10/1/12 0:00	9/30/14 0:00	NATIONAL SCIENCE FOUNDATION	TRAINA, SAMUEL J	$160,000
INST ARGENTINO SAFER HARMON 10/17 0%	11/1/12 0:00	10/31/17 0:00	ARGENTINA INSTITUTE FOR OCEANOGRAPHY	HARMON, THOMAS C	$25,158
UCSD/SEAGRNT INVERTEBRATE DAWSN 1/14 55%	11/1/12 0:00	1/31/14 0:00	DOC-DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC	DAWSON, MICHAEL	$9,991
NSF PARALLEL PATTERNS DAWSON 12/17 55%	1/1/13 0:00	12/31/17 0:00	NATIONAL SCIENCE FOUNDATION	DAWSON, MICHAEL	$1,369,982
NSF REU SITE YOSEMITE HART 2/16 8%	3/15/13 0:00	2/29/16 0:00	NATIONAL SCIENCE FOUNDATION	HART, STEPHEN C.	$318,150
NSF SPECIES ASSEMBLAGES BLOIS 3/16 55%	4/1/13 0:00	3/31/16 0:00	NATIONAL SCIENCE FOUNDATION	BLOIS, JESSICA L	$229,322
NASA AMES RESEARCH MILLER 4/16 26%	4/5/13 0:00	4/4/16 0:00	NASA-AMES RESEARCH CENTER	MILLER, NORMAN	$73,523
ABCA ERLY BUG DTC ORCHDS JOYCE 12/14 0%	5/1/13 0:00	12/31/14 0:00	ALMOND BOARD OF CALIFORNIA	JOYCE, ANDREA	$39,957
NSF DISSERTATION CAREY HART 5/15 55%	6/1/13 0:00	5/31/15 0:00	NATIONAL SCIENCE FOUNDATION	HART, STEPHEN C.	$20,061
			UC solar		$ 727,000
				Total FY 12/13 Awards	$7,539,500

SNRI Awards for FY 20113/14

fund_title	fund_beg_dat	fund_end_date	sponsor_name	pi_name	Awarded Amount
MELBOURNE MUSIC WINSTON 7/16 55%	7/2/13 0:00	7/1/16 0:00	ROYAL MELBOURNE INSTITUTE OF TECHNOLOGY	WINSTON, ROLAND	$134,545
CSU WATERSHED SCHOLARSHIP HARMON 7/15 0%	8/1/13 0:00	7/31/15 0:00	DOA-DEPARTMENT OF AGRICULTURE NATIONAL INSTITUTE FOR FOOD AN	HARMON, THOMAS C	$40,000
UCB GROUNDWATER MILLER 06/14 26%	8/1/13 0:00	6/15/14 0:00	WELLINTEL	MILLER, NORMAN	$19,350
NSF FRESHWATER ECO HARMON 8/16 55%	9/1/13 0:00	8/31/16 0:00	NATIONAL SCIENCE FOUNDATION	HARMON, THOMAS C	$384,573
UCSC-USDA PHOSPHATE SOIL BEHRE 8/16 43%	9/1/13 0:00	8/31/16 0:00	DOA-DEPARTMENT OF AGRICULTURE MISCELLANEOUS AGENCIES	BERHE, ASMERET ASEFAW	$80,091
UCSC DRGHT RES CLIMT CHNG QUINN 8/15 55%	9/1/13 0:00	8/31/15 0:00	DOC-DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC	QUINN, NIGEL W	$33,000
NPS YOSEMITE COLLECTIONS HULL 5/16 17.5%	9/2/13 0:00	5/31/16 0:00	DOI-DEPARTMENT OF THE INTERIOR	HULL, KATHLEEN L.	$34,569
USDA LANDSCAPE CHANGE BALES 9/15 0%	9/3/13 0:00	9/2/15 0:00	DOA-DEPARTMENT OF AGRICULTURE MISCELLANEOUS AGENCIES	BALES, ROGER C	$150,000
NSF STHRN SIERRA CZO BALES 9/18 55%	10/1/13 0:00	9/30/18 0:00	NATIONAL SCIENCE FOUNDATION	BALES, ROGER C	$2,172,743
DWR SNAMP CONKLIN 5/14 0%	10/1/13 0:00	5/31/14 0:00	CA/DEPARTMENT OF WATER RESOURCES	CONKLIN, MARTHA H	$44,055
NSF GEOCHEMICAL PROP GHEZZEHEI 12/16 55%	1/1/14 0:00	12/31/16 0:00	NATIONAL SCIENCE FOUNDATION	GHEZZEHEI, TEAMRAT	$146,503
RLF CA PARK INSTE ROLLANDJ 1/15 5%	1/1/14 0:00	1/31/15 0:00	RESOURCES LEGACY FUND FOUNDATION	ROLLAND, ERIK	$100,000
NSF ISOTOPE TRACERS FOGEL 8/15 55%	2/1/14 0:00	8/31/15 0:00	NATIONAL SCIENCE FOUNDATION	FOGEL, MARILYN L	$122,811
NSF SOIL DYNAMIC LAND BERHE 3/19 55%	4/1/14 0:00	3/31/19 0:00	NATIONAL SCIENCE FOUNDATION	BERHE, ASMERET ASEFAW	$417,604
CADFW PISCES PROJECT VIERS 02/15 25%	4/10/14 0:00	2/28/15 0:00	CA/DEPARTMENT OF FISH AND GAME	VIERS, JOSHUA H	$74,902
USDA FIRE IMPCTS VGTN WESTERLING 5/19 0%	5/1/14 0:00	5/1/19 0:00	DOA-DEPARTMENT OF AGRICULTURE FOREST SERVICE	WESTERLING, ANTHONY	$75,000
LBNL CLM LAND MODEL KUEPPERS 9/14 26%	5/1/14 0:00	9/30/14 0:00	LAWRENCE LIVERMORE NATIONAL SECURITY, LLC	KUEPPERS, LARA	$19,833
GTI/ARPAE HBRD SLR WINSTON 4/15 55%	5/2/14 0:00	4/30/15 0:00	GAS TECHNOLOGY INSTITUTE	WINSTON, ROLAND	$450,980
NSF LEAF CUTTER ANTS HARMON 5/17 55%	6/1/14 0:00	5/31/17 0:00	NATIONAL SCIENCE FOUNDATION	HARMON, THOMAS C	$137,655
NPS CA CO-OP ECOSYSTEM BERHE 11/16 0%	6/1/14 0:00	11/30/16 0:00	DOI-DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE	BERHE, ASMERET ASEFAW	$9,030
USC ANTIOXIDANT AGING O'DAY 5/15 55%	6/1/14 0:00	5/31/15 0:00	UNIVERSITY OF SOUTHERN CALIFORNIA	O'DAY, PEGGY A	$42,327
			Chasing snow		34665
			UC solar		$ 727,000
				Total FY 13/14 Awards	$5,451,235

SNRI Awards for FY 2014/15

fund_title	award_number	fund_beg_date	fund_end_date	sponsor_name	pi_name	Award amount
DWR SNRI MGMT PRGM CONKLIN 06/16 0%	4600010378 T.O.#3	7/1/14 0:00	6/30/16 0:00	CA/DEPARTMENT OF WATER RESOURCES	CONKLIN, MARTHA H	$ 163,556
DOE CARBON CYCLE PRCSS CAMPBELL 6/15 55%	DE-SC0011999	7/1/14 0:00	6/30/15 0:00	DOE-DEPARTMENT OF ENERGY WASHINGTON D.C.	CAMPBELL, J. ELLIOT	$ 696,310
UCANR LAKE PAIR SYNCH JEPSEN 9/14 26%	SA14-2335-UCM	7/1/14 0:00	9/30/14 0:00	UC AGRICULTURE AND NATURAL RESOURCES	JEPSEN, STEVEN M	$ 37,745
ABCA ERLY BUG DTC ORCHD JOYCE 7/15 0%	14.ENT08JOYCE	8/1/14 0:00	7/31/15 0:00	ALMOND BOARD OF CALIFORNIA	JOYCE, ANDREA	$ 35,416
UCD/USDA ARGCLTRL CLMT RICE 8/15 0%	201400536-01	8/15/14 0:00	8/14/15 0:00	UNIVERSITY OF CALIFORNIA, DAVIS	RICE, ROBERT	$ 69,252
NSF ABI DVLPMNT FRST3D GUO 8/16 55%	DBI-1356077	9/1/14 0:00	8/31/16 0:00	NATIONAL SCIENCE FOUNDATION	GUO, QINGHUA	$ 265,854
USDA LIDAR & DOQQS MAP GUO 9/15 17%	14-CS-11272138-073	9/3/14 0:00	9/30/15 0:00	DOA-DEPARTMENT OF AGRICULTURE MISCELLANEOUS AGENCIES	GUO, QINGHUA	$ 38,409
RU/NASA SLR SYSTM EXPLOR FOGEL 9/16 55%		9/19/14 0:00	9/18/16 0:00	RUTGERS UNIVERSITY	FOGEL, MARILYN L	$ 16,276
NC STATEN ISLD SRVY CHEN 4/15 10%	08252014-2444	9/30/14 0:00	4/30/15 0:00	NATURE CONSERVANCY	CHEN, YANGQUAN	$ 18,000
USDA/CAFD SLR THRML DRM WINSTON 10/16 4%	59-2030-5-001	10/1/14 0:00	10/31/16 0:00	DOA-DEPARTMENT OF AGRICULTURE MISCELLANEOUS AGENCIES	WINSTON, ROLAND	$ 39,577
MID MRCD RVR EDCTN PRGM CONKLIN 6/17 0%		2/2/15 0:00	6/30/17 0:00	MERCED IRRIGATION SYSTEM	CONKLIN, MARTHA H	$ 268,423
USC/NIEHS HUMAN AXS AGNG O'DAY 11/15 55%	61933158	2/8/15 0:00	11/30/15 0:00	UNIVERSITY OF SOUTHERN CALIFORNIA	O'DAY, PEGGY A	$ 237,071
CPRB LEAFFTD PLANT BUG JOYCE 2/16 0%		5/1/15 0:00	2/29/16 0:00	CALIFORNIA PISTACHIP RESEARCH BOARD	JOYCE, ANDREA	$ 15,000
EL SIERRA SEA MDWS TSK 1 VIERS 12/15 55%	7891	5/15/15 0:00	12/31/15 0:00	EARTHWATCH, UNITED STATES	VIERS, JOSHUA H	$ 24,885
JPL/NASA METHANE SNIFFER CHEN 8/15 0%		5/20/15 0:00	8/6/15 0:00	JET PROPULSION LAB	CHEN, YANGQUAN	$ 15,000
BVF WATER BALNC SUSTNBITY BALES 5/16 5%		6/1/15 0:00	5/31/16 0:00	BELLA VISTA FOUNDATION	BALES, ROGER C	$ 20,309
WRTC NF CMMNTY FRST FCLTY DIAZ 9/18 25%	EPC 14-033	6/30/15 0:00	9/30/18 0:00	THE WATERSHED RESEARCH AND TRAINING CENTER	DIAZ, GERARDO C	$ 512,847
LLNS TRCKNG WATER ZONE CONKLIN 9/17 55%	B599552	6/30/15 0:00	9/30/17 0:00	LAWRENCE LIVERMORE NATIONAL SECURITY, LLC	CONKLIN, MARTHA H	$ 27,857
				UC Water		3529750
				UC solar		$ 727,000
					Total Award Amount	$ 6,758,537

Awards managed by SNRI Administrative Team FY 2010-2015

PI Last Name	PI First Name	Account	Award Amount	Project	Start Date	End Date	Sponsor	Award Title
Bales	Roger	449214	1,985,280.00	AMR (Fab 100010)	10/1/11	9/30/16	NSF	MRI: Development of a basin-scale water-balance instrument cluster for hydrologic, atmospheric and ecosystem science
Bales	Roger	449214	222,213.00	STEF (PINECREST)	7/17/12	5/31/16	USDA Forest Service	Variable Thinning Using Historical Stand Structure Data to Create Fire-resilient Forests an Enhance Ecosystem Services in a Changing Climate
Bales	Roger	449214	77,500.00	KREW	9/12/12	9/30/16	USDA Forest Service	Watershed Function & Effects from Forest Restoration: Kings River Experimental Watershed & Critical Zone Observatory
Bales	Roger	449214	121,841.00	SWEEP2/ANR	11/1/12	10/31/16	UC ANR	Effects of Forest Management on Water Yiends and Other Ecosystem Services in Sierra Nevada Forests
Bales	Roger	449214	5,122,740.00	PIMRB	10/1/13	9/30/19	NSF	Southern Sierra Critical Zone Observatory
Bales	Roger	449214		RESRB	10/1/13	9/30/19	NSF	Southern Sierra Critical Zone Observatory
Bales	Roger	449214		CORE/MAIN	10/1/13	9/30/19	NSF	Southern Sierra Critical Zone Observatory
Bales	Roger	449214	150,000.00	-	9/3/13	8/30/18	USDA Forest Service	Climate and Landscape-Change Effects Research on Water Quantity and Quality of Forests in Sierra Nevada (and Comparative Areas)
Bales	Roger	789214		Financial Aid Acct.	10/1/13	9/30/19	NSF	Southern Sierra Critical Zone Observatory
Bales	Roger	449208		Overhead Variance	10/1/13	9/30/19	NSF	Southern Sierra Critical Zone Observatory
Bales	Roger	449209		Participant Support	10/1/13	9/30/19	NSF	Southern Sierra Critical Zone Observatory
Bales	Roger	449214	19,342.00	Bella Vista/SWEEP	6/1/15	5/31/16	Bella Vista Foundation	Water-balance field measurements for forest sustainability
Bales	Roger	449214	3,529,750.00	UC Water/WASSRI RB	1/1/15	12/31/18	UCOP	UC Water Security and Sustainability Research Initiative
Bales	Roger	449214	34,665.00	Chasing Snow	1/1/14	12/31/15	The Yosemite Foundation	Chasing Snow: How Will Changing Snow Affect Yosemite's Resources
Berhe	Asmeret	449253		UCM-A	10/1/13	9/30/19	NSF	Southern Sierra Critical Zone Observatory
Campbell	Elliot	449214	314,504.00	-	7/1/12	9/30/16	UC Lab Fees Research Program	Quantifiying Urban CO2 fluxes using carbonyl sulfide and 14C
Campbell	Elliot	449214	249,277.00	AFRI	9/1/12	8/31/16	University of Missouri (USDA prime)	Farmer Adaptation to Climate-Induced Yield Changes and Market Impacts
Campbell	Elliot	449214	1,045,721.00	DOE-Brazil	7/1/14	6/30/17	US Department of Energy DC	Scaling from Flux Towers to Ecosystem Models: Regional constraints on Carbon Cycle Processes from Atmospheric Carbonyl Sulfide
Campbell	Elliot	449214	25,846.00	Vernal Pool/ISEECI	4/1/15	12/31/15	UC Santa Cruz (UC MRPI prime)	Using UC Reserves to Detect and Forecast Climate Impacts
Campbell	Elliot	789214		Vernal Pool/ISEECI	4/1/15	12/31/15	UC Santa Cruz (UC MRPI prime)	Using UC Reserves to Detect and Forecast Climate Impacts
Chen	YangQuan	449216	144,410.00	ANR-UAV	4/1/14	3/31/19	UC-ANR	Evaluating and Extending the Use of Small, Multi-Rotor Unmanned Aerial Vehicles (UAV's) as a Crop Monitoring Tool
Conklin	Martha	449214		UCM-C	10/1/13	9/30/19	NSF	Southern Sierra Critical Zone Observatory
Conklin	Martha	449214		CZO-E&O	10/1/13	9/30/19	NSF	Southern Sierra Critical Zone Observatory
Conklin	Martha	449214	163,556.00	TASK3	7/1/14	6/30/16	DWR	Sierra Nevada Adaptive Management Program, Merced-Task Order 3
Conklin	Martha	449214	268,423.00	Tioga Project	2/4/15	6/30/17	MID (DWR prime)	Merced River Education and Enhancement Program
Conklin	Martha	449214		Educational Project	2/4/15	6/30/17	MID (DWR prime)	Merced River Education and Enhancement Program
Conklin	Martha	449214		Big Sandy Project	2/4/15	6/30/17	MID (DWR prime)	Merced River Education and Enhancement Program
Conklin	Martha	449214	161,999.00	LLNL	6/30/15	9/30/17	Lawrence Livermore National Security	Lawrence Livermore National Security, LLC
Conklin	Martha	449214	3,529,750.00	UC Water/WASSRI MC	1/1/15	12/31/18	UCOP	UC Water Security and Sustainability Research Initiative
Frank	Carolin	449253	1,623,786.00	DIMENSIONS	1/1/15	9/30/18	NSF	Dimensions: Taxonomic, genetic, and functional biodiversity of above-ground bacterial endophytes in subalpine conifers
Guo	Qinghua	449214	265,854.00	Forest3D	9/1/14	8/31/16	NSF	ABI Development: Forest3D - An Open Source Platform for Lidar Applications in Forestry
Guo	Qinghua	449214	38,408.76	DOQQs	9/3/14	12/31/15	USDA Forest Service	Using LiDAR and DOQQs to Map Forest Vegetation for Assessing Wildlife Habitat
Hart	Stephen	449253		UCM-H	10/1/13	9/30/19	NSF	Southern Sierra Critical Zone Observatory
Hart	Stephen	449253	318,150.00	REU	3/15/13	2/29/16	NSF	REU Site: Yosemite Environmental Science Research Training
Hart	Stephen	449205		REU	3/15/13	2/29/16	NSF	REU Site: Yosemite Environmental Science Research Training
Hart	Stephen	789253		REU	3/15/13	2/29/16	NSF	REU Site: Yosemite Environmental Science Research Training
Hart	Stephen	449253	92,643.00	Cal Trout	6/15/15	6/14/18	California Trout	Developing a Protocol for Net Carbon Sequestration from Restoration of Eastern Sierra Meadows
Hart	Stephen	449253	5,428.00	South Yuba	7/1/15	6/30/16	South Yuba River Citizens League	Greenhouse gas fluxes and carbon sequestration potential of restored and unrestored meadows in the Sierra Nevada
Hosley	David	629001	600,000.00	-	9/1/10	9/30/16	USDI	National Parks Insitute
Hosley	David	269843	-	-	9/1/10	9/30/16	-	National Parks Insitute - Program Income Acct
Hull	Kathleen	449315	89,363.00	NAGPRA	9/1/12	12/31/15	USDI	El Portal NAGPRA Project
Hull	Kathleen	449315	34,569.00	-	9/2/13	5/31/16	NPS	Research and Reporting for Yosemite Archeological Collections
Rice	Robert	449214	69,252.00	UCD	8/15/14	8/14/16	UC Davis (USDA NIFA)	Agricultural sensitivity to climate change and water resources interactions in the San Joaquin Valley, Calif. And system resilience offered by adaptation strategies.

Joyce	Andrea	449214	15,000.00	Pistachio	5/1/15	2/29/16	California Pistachio Research Board	Molecular identification of leaffooted plant bug and stink bug species and strains in pistachio orchards
Joyce	Andrea	449321	20,000.00	West Nile	7/1/15	6/30/16	Mosquito Research Foundation	Testing West Nile infection rates of C. pipiens in habitat of Merced County
Kueppers	Lara	442610	4,995,279.00	-	8/1/07	7/31/16	DOE	Sup Alpine Species Range Shifts with Climate Change: temperature and soil moisture manipulations to test species and population responses
Kueppers	Lara	442683		-	8/1/07	7/31/16	DOE	Sup Alpine Species Range Shifts with Climate Change: temperature and soil moisture manipulations to test species and population responses (Overhead Variance)
Kueppers	Lara	449253		-	8/1/07	7/31/16	DOE	Sup Alpine Species Range Shifts with Climate Change: temperature and soil moisture manipulations to test species and population responses
O'Day	Peggy	449253	300,000.00	-	9/15/12	8/31/16	NSF	Collaborative Research: Quantifying the Reactive Surface Area of Environmental Solids
O'Day	Peggy	449253	300,126.00	-	9/15/11	11/30/15	DOE	Uranium and Strontium Fate in Waste-Weathered Sediments: Scaling of Molecular Processes to Predict Reactive Transport
O'Day	Peggy	449253	112,607.00	-	2/9/15	11/30/15	USC (NIH prime)	Human Models of the Nanoparticulate-Induced Inflammatory/Antioxidant Axis in Aging
Safeeq	Mohammad	449001	74,650.00	USDA Forest Service	7/30/15	6/30/17	USDA Forest Service	Forests and Water in Changing Climate: The Role of Forest Management in Keeping the Balance
Viers	Joshua	449214	35,000.00	Vollmar	1/1/14	12/31/16	Vollmar Natural Land Consulting	Assessment of Conservation Status of Vernal Pool Habitat in the Central Valley
Westerling	Anthony	449214	60,197.00	-	4/1/12	3/31/16	UCSD (NSF Prime)	Multiscale Modeling of Aerosol Indiret Effects on Decadal Timescales
Westerling	Anthony	449214	60,000.00	CIMEC (CNAP 1-YR)	7/1/15	6/30/16	UCSD (NOAA Prime)	Drought Early Warning for the California Region
Westerling	Anthony	449214	275,000.00	CNAP	9/1/11	8/31/16	UCSD (NOAA Prime)	California Nevada Applications Program
Westerling	Anthony	449214		USDA-AFRI	9/1/12	8/31/16	Penn State	Projecting Climate Change Mitigation and Adaptation in Fire-Prone Forests Under Future Climate Change
Westerling	Anthony	449214		USDA-AFRI	9/1/12	8/31/16	Penn State	Projecting Climate Change Mitigation and Adaptation in Fire-Prone Forests Under Future Climate Change (new FAU opened; fund 25202 was given erroneous series)
Westerling	Anthony	449214	75,000.00		5/1/14	5/1/19	USDA Forest Service	Modeling Potential Fire, Emissions, Suppression Costs, and WUI Impacts with Different Landscape Vegetation Scenarios under Changing Climate
Aguilar	Andres	442606			5/10/10	8/31/12		Vernal Pool Invertebrate Survey
Guo	Qinghua	449214	38,408.76	DOQQs			USDA Forest Service	Using LiDAR and DOQQs to Map Forest Vegetation for Assessing Wildlife Habitat
Rolland	Erik		300,000.00	DPR			Department of Parks and Recreation	The UC Merced California State Parks Institute

Bales	Roger	449214	43,887.00	CITRIS	5/1/14	6/30/15	CITRIS	CITRIS Seed Funding: Quantifying the Value of Hydrologic Forecasting for Intelligent Hydropower Operations
Conklin	Martha	449214	165,000.00	TASK19	10/1/13	1/31/15	DWR	Sierra Nevada Adaptive Management Program, Merced-Task Order 19
Frank	Carolin	449253	150,337.00	EAGER	1/1/14	12/31/14	NSF	EAGER: Nitrogen Fixing Bacterial Endosymbioses in Above Ground Conifer Tissue
Jepsen	Steven	449001	37,745.00	-	7/1/14	12/31/14	UC ANR	Lake-Pair Synchronicity as an Indicator of Permafrost Change in Arctic Regions
Joyce	Andrea	449214	17,555.00	Mosquito	9/1/12	6/30/15	Mosquito Research Foundation	Population genetic structure of the Culex pipiens complex in Merced County
Joyce	Andrea	449001	11,650.00	-	7/1/12	12/31/14	UCOP	Behavioral insights to Understand Genetic Isolation in a Maize Pest, the leafopper Dalbulus Maidis
Joyce	Andrea	449214	35,439.00	14.ENTO8.Joyce	8/1/14	7/31/15	Almond Board of California	Early Detection of Leaffooted Plant Bug in Almond Orchards
Joyce	Andrea	449214	36,959.00	13.ENTO8.Joyce	8/1/13	12/31/14	Almond Board of California	Early Detection of Leaffooted Plant Bug in Almond Orchards
Miller	Norman	449253	72,153.00	-	7/1/12	8/31/15	UCB (NSF prime)	CNH: Wetland Persistence in a Working Landscape: Links between Landowner Decisions, Climate, Disease, Ecology, and Metapopulation Dynamics
Miller	Norman	449253	73,523.00	-	3/1/13	2/28/15	NASA	Evaluation of Impacts of Climate Variability and Change at NASA Ames Research Center
O'Day	Peggy	449253	781,992.00	-	9/15/10	11/30/14	DOE	Molecular Mechanisms and Kinetics of Microbial Anerobic, Nitrate-Dependent U(IV) and Fe(II) Oxidation
O'Day	Peggy	449253	42,327.00	NIH-R56	6/1/14	5/31/15	USC (NIH prime)	Human Models of the Nanoparticulate-Induced Inflammatory/Antioxidant Axis in Aging
Rolland	Erik	629213	100,000.00	RLF	1/1/14	1/31/15	Resources Legacy Fund	Development and Implementation of the California State Parks Institute

Conklin	Martha	449214	200,485.00	USDA-SNAMP (TO12)	9/1/12	9/30/15	UC Berkeley (USDA prime)	Sierra Nevada Adaptive Management Program
Guo	Qinghua	449214	57,449.00	SNAMP	9/1/12	9/15/15	UC Berkeley (USDA prime)	Sierra Nevada Adaptive Management Program
		Total	28,792,039.52					

Sierra Nevada Research Institute Director's Council

Purpose
The SNRI Director's Council is composed of leaders from industry, academia and the public sector to provide an external perspective as the Institute grows in its capacity to provide and disseminate new knowledge that sustains the environment and ecosystems of California and related regions worldwide.

Work of the Council
The SNRI Director's Council supports the mission of the Institute in multiple ways, including:

- Research and educational partnerships
- Insights on industry trends and societal needs that may inform faculty decisions on research and curricular development
- Advocacy and legislative education
- Philanthropic partnerships
- Creation of internships and service learning sites
- Sharing of research results, data and information with public and private stakeholders

Composition of the Director's Council
Initially, the Council will be composed of 12 to 20 members serving for three-year terms with the potential for a second term if desired. The makeup will be roughly split in thirds among the three sectors. An initial focus on California may be expanded to national and international participation in the future.

Meeting Frequency and Dates
The Director's Council will meet in person twice a year. Other meetings may occur by conferencing electronically as needed, but the members will also be invited to a small number of events on campus, at research sites or other locations and members may attend these additional events as their schedules allow. This year's meetings will be January 2016 at the UC Merced and a later summer date to be determined.

Expectations of Member Support
Director's Council members are encouraged to support the Sierra Nevada Research Institute through their time, knowledge and funds. Since capacity for financial support varies, members should consider what is a significant contribution in their individual situation. It is anticipated that as a whole attendance will be high, efforts outside of meetings will be 10 to 20 hours a year, and financial support will average $1,000 per member, either from organizational or personal funds.

DEPARTMENT NAME: Sierra Nevada Research Institute

SNRI Workforce Strategic Plan 2015-2020

WORKFORCE STRATEGIC PLAN - CURRENT STATE (PERMANENT STAFF) | **Total PERM Budget: $300,140 Total PERM FTE: 4.80**

1 **Function** *Include major functions (i.e. "research compliance" or "academic advising") but also operational functions (i.e. "calendaring" or "travel reimbursement")*	2 **How Currently Staffed** *Full (100%) or fractional FTE to perform function. If fractional, estimate percentage.*	*Note level of position and whether position is represented (R) or non-represented (NR).*	*Does a gap exist for this function? Or might there be surplus capacity?*	3 **Relative Importance** *C = Critical to mission I = Important OS = Organizational support*	4 **Estimated Cost/Year** *Rough estimate of salary, benefits, other costs*	5 **Alternative staffing options** *Could this be outsourced? Shared? Performed by a center of excellence? If not, why not?*
Faculty Director	stipend	Professor-NR	No	C	54,425	No-Required of ORU
Executive Director: Provide administrative leadership to promote efficient, equitable and cost-effective functioning of ongoing SNRI programs, and effective development of new programs.	1.00	Executive Director-NR	No	C	173,579	NO - Requires establishing and maintaining strong working relationships with SNRI faculty, representing SNRI in discussions with other UC Merced units and with external collaborators. Specialized knowledge is required for research development efforts, communications and support.
Business Manager: Responsibilities include: i) transactions for Human Resources, Academic Personnel, student hires, international employees, financial management, recharge, procurement, travel, ii) grant administration, iii) event planning, iv) supervising the SNRI administrative staff. Also provides the above services to the Natural Reserve System (F103) and the Environmental Analytical Lab (F117).	1.00	Admin. Supervisor 2-NR	No	C	96,823	No-This position requires knowledge of many aspects of business operations, university policies and procedures as well as the communication skills to build relationships with administrators, faculty, staff and other universitites.
Grant manager: Is responsible for post-award research administration functions.	1.00	Research Administrator 3-NR	No	C	93,114	No-Requires specialized knowledge of grants managemnet, OMB and agency rules, and communications skills to work with faculty.
Administrative specialist: Assists with: i) human resource and student hires for SNRI faculty, ii) does event planning for local and off campus events for SNRI and faculty, iii) assists with procurement.	1.00	Admin. Officer 3-NR	No	C	84,315	No-This position requires constant communication with Principal Investigators concerning the funding of effort of awards, changing appointment status as per the availability of funds.
Administrative specialist: Procurement, to include managing 6 procurement cards, travel and general reimbursements, arranging travels, scheduling conference room and 6 SNRI vehicles, completing recharge for TAPS process, provides the above services to the NRS (F103) and to the EAL (F117).	1.00	Admin. Officer 2-NR	No	C	69,355	No- This posiiton requires daily direct contact with SNRI Director, faculty, researchers and students; it also is required to be well versed on the procurement policies and procedures associated with grant funding for the sponsors of SNRI faculty grants.

DEPARTMENT NAME: Sierra Nevada Research Institute

WORKFORCE STRATEGIC PLAN - CURRENT STATE (TEMPORARY STAFF)

Total TEMP Budget: $40,378 Total TEMP FTE N/A

1 **Function** *Example: Research Compliance; Marketing; Academic Advising*	2 **How Currently Staffed** *Full (100%) or fractional FTE to perform function. If fractional, estimate percentage.*	*Note level of position and whether position is represented (R) or non-represented (NR).*	*Does a gap exist for this function? Or might there be surplus capacity?*	3 **Relative Importance** *C = Critical to mission I = Important OS = Organizational support*	4 **Estimated Cost/Year** *Rough estimate of salary, benefits, other costs*	5 **Alternative staffing options** *Could this be outsourced? Shared? Performed by a center of excellence? If not, why not?*
Administrative Assistant: Scheduling conference room and vehicles, first point of contact for SNRI walk-in customers, assist other SNRI permanent staff as needed.	1.00	R	No	I	50,000.00	No-As the first point of contact, this position must be physically located in the SNRI office.

SNRI Workforce Strategic Plan –
5 Year Vision Statement 2015-2020

Background. In 1999 a prospectus was published outlining the creation of the **Sierra Nevada Research Institute**. Since 2002, when the founding director of SNRI joined UC Merced, founding and new faculty have grown the Sierra Nevada Research Institute into an exemplary expression of the value and impact that this world-class research institution has for this region of California, the Sierra Nevada and Central Valley. The breadth and reach of SNRIs research partnerships and community engagement throughout the region, state, nation and world is a testament to the vision of the founders of UC Merced, and the creators of SNRI. Faculty and researchers work with State, Federal and local agencies as well as private landowners to concentrate the power of the UC on the critical questions facing the region. SNRI maintains this regional focus that the founders envisioned, using the region as a natural laboratory to address challenges around sustainability, resource management, environmental quality and public health. The areas of research represented by SNRI have contributed greatly to UC Merced's reputation as a research university, and are central to our ability to both chart a sustainable future and adapt to the unprecedented changes facing our society and ecosystems as the world's population increases and climate warms.

Even a cursory scan of trends in academic research shows that there is significant potential for growth in the areas represented by SNRI, including federal, state and private extramural opportunities. We thus expect growth in funding by SNRI faculty to continue. Polling of SNRI faculty has confirmed that the proposal and grant loads will continue to increase. It should be noted that some SNRI faculty use pre-award and post-award services from the 3 schools. A few SNRI faculty are also members of HSRI and it may be more appropriate for them to run human-health grants through HSRI, and other grants through SNRI. Similar specialization with the schools may create efficiency in allowing staff to specialize on certain agencies and faculty. However, a central function of an ORU is to provide efficient, timely support to its faculty and researchers, enabling them to be productive researchers and focus on discovery, analysis, publication and other creative and service activities. At this point, we have not recommended moving any of the grant-funded support to a central administrative-support office. However, a central office could be used for the relatively small number of transactions that SNRI does in support of the Environmental Analytical Laboratory. Following are the new positions needed to support that research.

Pre-award services (FY 17). Up until this spring, Research and Development Services (RDS) and the Sponsored Projects Office (SPO) within the Office of Research have provided pre-award support to SNRI faculty preparing and submitting grants. However, due to the increasing workload within RDS and SPO, the Vice Chancellor of Research has cut back those services and asked that SNRI request a full-time staff member within SNRI to take over those duties for SNRI faculty and researchers. This position is thus needed immediately (Research Administrator 4), and will continue indefinitely under the current organization of the Office of Research and UC Merced. This is a specialized position, who will develop knowledge of the proposal process for the sponsors of research carried out by SNRI faculty.

Post-award services (FY 17). SNRI faculty have been very productive in securing extramural funding, including some large multi-investigator and hundreds of smaller grants. With the increase in faculty at UC Merced, SNRI will continue to welcome new faculty members into the

ORU, and this will bring additional sponsored funding to be administered through the unit. This will include the compliance component of the Research Administrator, the purchasing, travel, human-resource, academic-personnel and other services provided by SNRI. An additional purchasing specialist is needed to fulfill the increasing stream of transactions and requests (Administrative Assistant 1).

Post-award services (FY 18). This grants-management position addresses the increasing workload on the Research Administrator 3 position, and is based on the projected increase in SNRI faculty and grants (Research Administrator 2).

Post-award services (FY 19). This administrative specialist (Administrative Officer 2) will assist with the increasing work load on the current Administrative Officer 3 and Administrative Officer 2, in the areas of: i) human resource and student hires for SNRI faculty, ii) event planning for local and off campus events for SNRI and faculty, iii) procurement, iv) travel, v) general reimbursement, vi) scheduling and vi) recharge.

DEPARTMENT NAME _____

WORKFORCE STRATEGIC PLAN - GETTING TO FUTURE STATE

1 **Function** **SNRI** *Transfer from current and future states.*	2 **Recommended Action** *Designate as follows:* *K - Keep E - Eliminate* *C - Create S - Share* *O - Outsource* *SS - Service Center*	**3 - Future Sequencing (FTE and Budget)** *Excluding functions that could be outsourced, eliminated or absorbed in a service center, estimate how many FTE will be required perform function. At what levels? Group under the fiscal year they will be needed, noting the projected budget, enrollment and faculty load levels, and designate whether represented (R) or non-represented (NR)*							
		Year One - FY 16-17 ***Projected Perm Budget: 318,732*** ***Projected Enrollment: 7,657*** ***Projected Faculty* : 360***		**Year Two - FY 17-18** ***Projected Perm Budget: 336,051*** ***Projected Enrollment: 8,260*** ***Projected Faculty* : 376***		**Year Three - FY 18-19** ***Projected Perm Budget: 354,123*** ***Projected Enrollment: 9,057*** ***Projected Faculty*: 395***		**Year Four - FY 19-20** ***Projected Perm Budget: 372,977*** ***Projected Enrollment: 9,935*** ***Projected Faculty*: 413***	
		FTE	***Budget***	***FTE***	***Budget***	***FTE***	***Budget***	***FTE***	***Budget***
Faculty Director (Stipend)	K		53,536.00		55,142.00		56,796.00		58,500.00
Executive Director_NR	K	**1**	178,786.00	**1**	184,150.00	**1**	189,675.00	**1**	195,365.00
Admin. Supervisor 2_NR	K	1	99,728.00	1	102,720.00	1	105,801.00	1	108,975.00
Research Administrator 3_NR	K	1	95,907.00	1	98,785.00	1	101,748.00	1	104,801.00
Admin. Officer 3_NR	K	1	86,844.00	1	89,450.00	1	92,133.00	1	94,897.00
Admin. Officer 2-NR	K	1	71,436.00	1	73,579.00	1	75,786.00	1	78,060.00
Research Administrator 4_NR	C	1	120,791.00	1	124,415.00	1	128,147.00	1	131,992.00
Administrative Assistant 1_R	C	1	51,500.00	1	53,045.00	1	54,636.00	1	56,275.00
Research Administrator 2_NR	C			1	90,402.00	1	93,114.00	1	95,908.00
Admin. Officer 2_NR	C					1	71,436.00	1	73,579.00

* Projected faculty includes ladder-rank and temporary

DEPARTMENT NAME _____

WORKFORCE STRATEGIC PLAN - GETTING TO FUTURE STATE

4 - Sequencing (FTE and Budget)- SNRI

Excluding functions that could be outsourced, eliminated or absorbed in a service center, estimate how many FTE will be required perform function. At what levels? Group under the fiscal year they will be needed, noting the projected budget, enrollment and faculty load levels, and designate whether represented (R) or non-represented (NR)

Year Five - FY 20-21		Year Six - FY 21-22		Year Seven - FY 22-23		Year Eight - FY 23-24		Year Nine - FY24-25		Year Ten - FY25-26	
Projected Perm Budget: 396,495		*Projected Perm Budget: 422,677*		*Projected Perm Budget: 448,437*		*Projected Perm Budget: 465,258*		*Projected Perm Budget: 482,685*		*Projected Perm Budget* _____	
Projected Enrollment: 10,696		*Projected Enrollment: 10,877*		*Projected Enrollment: 10,982*		*Projected Enrollment: 10,990*		*Projected Enrollment: 10,909*		*Projected Enrollment:*	
Projected Faculty: 432*		*Projected Faculty*: 456*		*Projected Faculty*: 482*		*Projected Faculty*: 482*		*Projected Faculty*: 482*		*Projected Faculty*:*	
FTE	*Budget*	*FTE*	*Budget*	*FTE*	*Budget*	*FTE*	*Budget*	*FTE*	*Budget*	*FTE*	*Budget*
	60,255.00		62,063.00		63,925.00		65,842.00		67,818.00		69,852.00
1	201,123.00	**1**	207,262.00	**1**	213,480.00	**1**	219885.00	**1**	226481.00	**1**	233276.00
1	112,244.00	1	115,611.00	1	119,080.00	1	122,652.00	1	126,312.00	1	130,121.00
1	107,945.00	1	111,183.00	1	114,519.00	1	117,954.00	1	121,493.00	1	125,138.00
1	97,744.00	1	100,676.00	1	103,697.00	1	106,807.00	1	110,012.00	1	113,311.00
1	80,402.00	1	82,814.00	1	85,298.00	1	87,857.00	1	90,493.00	1	93,208.00
1	135,952.00	1	140,030.00	1	144,231.00	1	148,558.00	1	153,015.00	1	157,605.00
1	57,963.00	1	59,702.00	1	61,493.00	1	63,338.00	1	65,238.00	1	67,195.00
1	98,785.00	1	101,749.00	1	104,801.00	1	107,945.00	1	111,184.00	1	114,519.00
1	75,786.00	1	78,060.00	1	80,402.00	1	82,814.00	1	85,298.00	1	87,857.00

* Projected faculty includes ladder-rank and temporary

SNRI

UC MERCED

SIERRA NEVADA RESEARCH INSTITUTE
BUSINESS PLAN | FY 12 TO FY 17

EXECUTIVE SUMMARY

THE SIERRA NEVADA RESEARCH INSTITUTE focuses on discovering and disseminating new knowledge that contributes to sustaining natural resources and promoting social well being in the Sierra Nevada-San Joaquin Valley region, and related regions worldwide. SNRI research is aimed at understanding and predicting changes that result from climate warming, landcover changes, population pressures, and interacting forces. SNRI was part of the original 1997 Academic Plan for the UC Merced campus, and UC Merced's first research partnership with decision makers in the region.

The institute's principal service area, the Sierra Nevada and surrounding valleys, extends through the San Joaquin Valley to the coastal range, up through the Feather and Sacramento Rivers, down to the Kern, and east into the Lahontan Basin. But its research has worldwide implications, and extends through the National Parks Institute to how managers of parks and other open spaces provide ecosystem services.

The faculty associated with SNRI address knowledge gaps in climate, hydrology, ecosystem management and other disciplines. SNRI faculty participate in the University of California Natural Reserve System and the UC Center for Information Technology in the Interest of Society.

SNRI will grow over the next five years adding affiliated faculty, support staff and funding sources while shifting the mix of funding from general fund support to include more direct and indirect research and private support. It will deepen, and add, partnerships and also expand its communication efforts and media relations.

The leadership expects the annual budget of research and programs administered or hosted by SNRI to grow over the next five years, with commensurate advances in physical space on campus and research infrastructure in the Sierra Nevada and San Joaquin Valley.

The vision is for SNRI operations and programs to be largely supported by funds originating from extramural sources by 2016. SNRI expects to have 30-35 affiliated faculty by that date, with at least half of them closely associated and others more loosely involved.

Current budget for core operations, including program development activities, is about $300,000, with another $340,000 in programs managed directly by SNRI for the campus. In addition, SNRI hosts or administers $500,000 in programs in cooperation with other campus units. Perhaps most importantly, over the past four years SNRI faculty have been responsible for about 40% of extramural research awards to UC Merced, over $6 million per year. These amounts are projected to grow over the next five years.

"It is an exceptional circumstance that a research and teaching university of the caliber of UC Merced...is so close to some of the finest National Parks in the world. The opportunities for partnership in the greater scale between the Institution of the National Park system and the University of California system is quite extraordinary for the advancement of research and teaching especially in the fields of biology and earth sciences."
E.O. WILSON

PROFILE

SNRI was the first and is the largest research institute or center on campus, and is the most successful in terms of research grants. It is currently (2011-12) the only Organized Research Unit at UC Merced. With its focus on research and knowledge gaps in the Sierra Nevada and surrounding valleys, SNRI fills a clear and much-needed niche and leadership position in the UC system.

At present (2011-12) 27 of UC Merced's 140 faculty are affiliated with SNRI. Over the past four years extramural research awards to SNRI-affiliated faculty have totaled $3.5-7.2 million per year, or 25-55% of the campus total. For more information, please see the following two reports, which are updated annually:

- SNRI Annual Report
- SNRI Strategic Plan

The director of the Sierra Nevada Research Institute is appointed by the Chancellor, but reports to the executive vice chancellor and provost. The university's financial support for SNRI comes via the budget of the vice chancellor for research and graduate studies.

There are currently 3.5 FTE assigned to SNRI's core operations (fall 2011).
The positions are:

- Faculty director
- Administrative analyst
- Administrative specialist (half time)
- Purchasing specialist (From Office of Research budget)
- Management Services Officer (MSO) (split w/ other OR units)
- Executive director (under discussion)




SITUATIONAL ANALYSIS

Demand Curve: The Sierra Nevada Research Institute is riding a wave that is far from cresting. The knowledge gaps around resource management are huge, and affect the core of our economy and society. For example, the science of climate change is providing increasing data of profound world change that is pushing societal and economic well-being to a point from which we cannot recover. Governments are responding unevenly, with California in the forefront of legislative action in the United States, but not the world. Groundbreaking laws such as SB 375 and AB 32 are being followed by federal requirements to attain air quality standards by reducing emissions, increase housing density in urban areas and provide greater choice in public transportation. Corporations are acting to comply with higher standards, including the need for alternative sources for production of energy.

Federal, state and local governments are changing their own practices, in part due to the need to reduce their costs in the wake of a prolonged economic slump. While the economy of the state is expected to slowly improve during the five years of this business plan, it is likely that the momentum to understand and better predict the response of critical ecosystem services to change — and in particular water supply, water use, and ecosystem response to climate-driven changes in the

"Both universities and national parks have perpetuity in their mission – they are all about the future. UC Merced is investing in students as leaders for the future - the NPS is in the business of providing the opportunity for enjoyment and preservation for future generations - so, we are in this together."

JON JARVIS

water cycle — will outpace it considerably and so will the importance of the Sierra Nevada and adjoining San Joaquin Valley as a natural laboratory, given its size and importance to the state, nation and world. As the Sierra and its ensuing rivers go, so goes the greatest supplier of agriculture and aquaculture on the planet.

UC Merced is positioned to build on its already significant status as a thought leader about adaptive management of the Sierra Nevada forests and implications for runoff. There is great opportunity to advance the thinking about resource conservation in the San Joaquin Valley, including above- and below-ground water supplies. While its much older sister campuses, UC Berkeley and UC Davis, are both making significant contributions to ecological studies, Berkeley is less active in the Valley and southern Sierra, and Davis is primarily working from an agricultural perspective in the San Joaquin Valley. Plus Davis has a significant focus on water issues in the Sacramento-San Joaquin Delta.

An institute of excellence in the development of new information and interpretation of what it means for the future is well suited for growth, not only in the short term of five years, but in the long term of 40 years and beyond as the population of the San Joaquin Valley doubles.

The strengths of the SNRI-affiliated faculty are in climate, hydrology, ecology, soil science, environmental chemistry, environmental policy, resource management, and environmental social science. Addition of faculty that affiliate with SNRI at the rate of at least one per year should address needed expertise in ecosystem science, ecological engineering, natural resources management, air quality management, water resources systems, public health, and environmental management. Currently, there are 25 post-doc researchers and 45 graduate students affiliated with SNRI. These numbers are also expected to build over the next five years.

Growth in research and other programs will require an equal number of support staff. In addition to the current analyst, specialist and assistant, there is available funding for an executive director to help with the growing workload in administering operations, communications, sustaining industry and government relationships, program development, and planning. As SNRI grows, additional administrative staff will also be needed, at the rate of one position a year.

While there are likely to be short-term constraints on research funding at the federal level, SNRI leadership believes funding for faculty doing work in the areas of SNRI's expertise will have very good opportunities for successful applications. In part, this optimism is also based on good likelihood of retention of faculty affiliated with SNRI, the plans for additional hires over the next five years, and the growth of programs related to management of parks and open spaces. An important milestone for annual research dollars is the $10 million level expected to be achieved toward the end of this plan's timeline.

Physical Space

Currently, the SNRI footprint on campus consists of approximately 1,374 square feet:

- Director's office (faculty office) in Science and Engineering: 160 sq. ft.
- An administrative office in Science and Engineering: 160 sq. ft.
- A staff office in Science and Engineering: 350 sq. ft.
- Two research offices in the Academic Office Annex: 110 sq. ft. and 109 sq. ft.
- A conference room in Science and Engineering: 485 sq. ft.

SNRI also manages the on-campus, 1,320-square-foot Environmental Analytical Lab.

At the Castle facility, SNRI has 1,500 square feet, which includes work benches. It is primarily used for staging field work and seasonal storage of gear. Multiple SNRI faculty and their research groups use this space.

It would be beneficial to continue having the lab, director's office, administrative offices and conference rooms adjacent to each other. The most active of affiliated faculty would prefer to be co-located, but offices relating to undergraduate majors are currently interspersed among the SNRI spaces.




SIERRA NEVADA FIELD STATIONS

Yosemite Field Station

Located within Yosemite National Park, the Yosemite Field Station (YFS) is a signature resource for UC Merced that serves programs across campus. It provides logistical support (office space, internet access, lab and classroom space, and housing) for research, education, and collaborative workshops inside. The YFS hosts a vibrant learning community with a critical mass of students (high school, undergraduate, and graduate), researchers, professors, and artists. It is also a part of the UC Natural Reserve System, which represents a permanent commitment by UC Merced and the UC Regents to maintaining the facility, in partnership with the Park. The YFS includes a station/office building, a laboratory/meeting building, and seven houses that can accommodate 40 people overnight.

Sequoia and Kings Canyon National Park

SNRI leases a small cabin that sleeps three, and a space through the courtesy of Delaware North Corporation that is used for lab work. This totals about 2,000 square feet. During this same period, the Wolverton Field Station in Sequoia and Kings Canyon National Park would be expanded to reflect growing research programs there.

A large focus for SNRI research is also in the Sierra National Forest, with the cooperation of the Forest Service. At present, UC researchers from several campuses share work space with researchers from the USFS Pacific Southwest Research Station. There is a clear long-term need for more permanent, dedicated space.


Sierra Nevada
Research Institute
Yosemite Field Station
USGS

POTENTIAL VALLEY FIELD STATION LOCATIONS

Campus Vernal Pool Natural Reserve

The proposed UC Merced Vernal Pool-Grasslands Nature Reserve will fill an unmet need for education on the extensive but dwindling vernal pool-grassland ecosystems in California's San Joaquin Valley. Once widespread throughout the Central Valley, these unique ecosystems are treasures of beauty and enlightenment, but are disappearing due to urbanization, land-use conversion and habitat degradation. They are one of the most imperiled wildlife habitats in California.

The proposed Reserve will inspire environmental stewardship and combine the study of natural science with vernal-pool preservation, demonstration and education programs to serve a diverse population in the region while also providing a primary research area for undergraduate and graduate students, as well as faculty members from the UC system.

South San Joaquin Valley

A South San Joaquin Valley Reserve is a priority because the area is critical for meeting the state's water needs for the next several decades. The area is an important location for understanding how climate change affects water and land management and our water supply.

FUNDING STREAMS

Historical Funding Sources

The Sierra Nevada Research Institute was recommended during the initial planning for UC Merced by faculty at other UC campuses who felt it would fill a need within the UC system and leverage the proximity of the campus to the mountains and its location in the Valley. As the first institute or center at the university, it has received University General Operating Funds available. Other institutes and centers are in the early stages of development including the National Parks Institute. There will be competition for state funding and this plan is a phased approach to changing SNRI's mix of revenues while accommodating natural and opportunistic growth.

SIERRA NEVADA RESEARCH INSTITUTE

	YR 1	YR 2	YR 3	YR 4	YR 5
CORE OPERATIONS					
Personnel (with benefits)	290,645	373,845	399,445	425,045	450,645
Supplies & Expenses	13,500	15,188	16,876	18,564	20,252
Programs	343,000	379,375	408,859	438,456	468,167
Vehicles[1]	51,000	61,336	63,886	73,722	76,272
National Parks Institute (NPI)[2]	400,000	400,000	400,000	400,000	400,000
OPERATIONS TOTALS	**$1,098,145**	**$1,229,744**	**$1,289,066**	**$1,355,787**	**$1,415,336**
REVENUE					
General Support (19900)	304,145	150,000	125,000	100,000	75,000
Indirect Return[3]	390,000	468,000	528,000	588,000	648,000
Vehicles Recharge	51,000	61,336	63,886	73,722	76,272
Programs Funding	343,000	379,375	408,859	438,456	468,167
National Parks Institute (NPI)[4]	400,000	400,000	500,000	500,000	500,000
Outside Support [5]	298,000	598,000	798,000	998,000	998,000
REVENUE TOTALS	**$1,786,145**	**$2,056,711**	**$2,423,745**	**$2,698,178**	**$2,765,439**

[1]Vehicle Lease & Maintenance in partnership with campus fleet services. Note: New vehicle leases in Years 2 and 4.
[2]National Parks Institute is incubated within Sierra Nevada Research Institute.
[3]Based upon assumption of 30% of extramural funds.
[4] Starting in YR2, revenue includes $250,000 taken from Outside Support
[5]Outside Support does not include $17.5M for buildings



TARGETS FOR GROWTH OF PRIVATE SUPPORT

Potential for research growth: SNRI provides resources to incentivise faculty to apply for additional research projects.

In terms of private support, there is no direct gift to the SNRI budget in FY10-11. A recent annual contribution is from an energy company that has donated $250,000 for scholarships and fellowships and is considering a larger contribution this fiscal year for the same purpose. This corporation is a good candidate for direct contributions to support research in future years.

Now that the National Parks Institute has funding for the next two years, those funds will be under the SNRI budget in the range of $400,000 annually. With additional professional training being offered in 2013 and 2014, NPI revenues can be expected to increase annually to $500,000.

There are six potential prospects moving from cultivation to application or asking in FY11-12. These are a mix of foundations, corporations, government agencies and individuals. Several requests will be for capital improvements, while others will be programmatic or to establish research efforts. It is anticipated that these prospects will yield between $250,000 and $500,000 in FY11-12 and FY12-13 and could support SNRI at $500,000 or more for the next three years.

There are a dozen other prospects in the early stages of cultivation or being researched. New opportunities will be identified in the next two fiscal years that will yield results toward the end of this business plan. Again, it is reasonable if the faculty associated with SNRI grows and matures as planned, an additional $500,000 to $1 million in annual extramural funds will result in FY13-14 and FY14-15.

While this is marked growth compared to the past five years of private support for SNRI, both the urgency to understand and act on climate change has accelerated significantly, and the addition of faculty and students is picking up as well. The National Parks Institute's incubation in SNRI is another factor that contributes to the expectation that revenues over the next five years will see sustained growth that in turn will lead to near self-sufficiency by the end of 2015.

Priorities for fundraising over the next five years include:

Academic building
Phase 1: $12-$15M
Phase 2: Larger building

Graduate fellowships:	$45,000 each
Undergraduate fellowships:	$2,000 each
GIS Lab:	$200,000
Greenhouse:	$2,500,000
National Parks Institute Incubation through 2015:	$250,000/year
Endowed Chairs:	$2,000,000 each

ADVISORY BOARDS

SNRI has an advisory board comprised primarily of faculty. It meets annually to review the strategic plan for the coming year. Members include:

Steven C. Hart, *Professor, School of Natural Sciences, chair*
Thomas C. Harmon, *Professor, School of Engineering*
Henry Jay Forman, *Professor, School of Natural Sciences*
Kathleen Hull, *Assistant Professor, School of Social Sciences, Humanities and Arts*
Tony Westerling, *Associate Professor, School of Engineering and School of Social Sciences, Humanities and Arts*
David Graber, *Chief Scientist for the Pacific West Region, National Park Service*

Director's Advisory Board

Some divisions, institutes and centers at UC Merced have external advisory boards to align teaching and research with industry and societal trends, exchange information and assist in revenue generation. SNRI is forming such a group, which will have representation from the private and public sectors, initially with about a dozen members. It will meet twice a year and be in place starting this fall.

PROMOTION AND OUTREACH

UC Merced has a centralized model for promotion. A public information officer is assigned to SNRI as one of several beats. Web design and social networking resources are also available from the Office of Communications, but content is largely to be provided by the institute.

Because of its success and being the only organized research unit and having been in existence since before UC Merced had students, the Sierra Nevada Research Institute has been featured in campus promotional efforts. Another significant factor is the relevance of its work to the state and nation's environmental policy and the national standing of its director. That much of its research is taking place in two prominent national parks and the most important agricultural region in the nation also positions SNRI for media coverage and other promotion and outreach opportunities.

"The water, vegetation and geochemistry are all interrelated, with feedbacks from each influencing the others. We could study the water cycle in isolation, but then we wouldn't understand the vegetation feedbacks. It's a challenge getting busy people together to talk and meet about our plans, but we have a team that is committed to collaboration rather than going off on their own to do the research."
ROGER BALES

Despite these advantages, only a portion of the attention received has been because of proactive efforts. More often coverage is responsive to inquiries, and often limited to one or two faculty associated with the center. As faculty are added over the next five years, there are tremendous opportunities to significantly increase promotion of SNRI as a vital entity informing critical issues and developing solutions to some of the critical societal challenges of our time. To take advantage of the opportunity, the capacity to understand where the opportunities for media exposure are and how best to take advantage of them will have to be grown, both on the part of SNRI staff and allocation of communication resources. The five-year budget incorporates this need in its personnel growth and other expense lines.

Recently, at the request of the communications staff, a new Web presence was developed for SNRI. It is an important tool in raising the profile of SNRI and its programs within the campus but also for prospective students, faculty and supporters and other external stakeholders.

The National Parks Institute Web pages are being transformed to an interactive one with video elements and forums for information sharing and discussion. Something similar for NPI and associated programs such as the Yosemite Leadership Program (YLP) and Adventure, Risk, Challenge (ARC) would move SNRI toward best practices and would help model the kinds of interactivity that other institutes and centers at UC Merced could adopt.

Good work has been done in recent years to deepen and widen outreach to others doing research in climate change and managing natural resources, as well as to people and groups who might wish to tap into the knowledge that faculty and graduate students are developing at UC Merced. These relationships are being nurtured as well by development staff, and in particular there are strong bonds with national parks and other groups conserving open spaces and protected lands. There is an opportunity going forward to reach out to people and organizations affected by policy and other changes in California and beyond. The diversity of UC Merced's student body and the strong programs engaging students in research and service in nearby parks make this next stage of outreach a natural as SNRI grows in the next few years.

Consistent with this desire to engage community members in a rapidly changing state, SNRI has a special role in bringing people to campus. Beyond expected conferences, speakers, and other events, the proposed Vernal Pool Reserve would attract students from elementary school through high school and provide teacher training as well. As it includes a building where the environmental significance of vernal pools and management of ag lands can be interpreted, it also can be a magnet for the general public and a source of recreation as an access point for hiking and observation of flora and fauna.



Promotion and outreach at higher levels over the next five years have significant importance for revenues of the SNRI. A higher profile and more engagement — both electronically and in person — will impact the ability to attract support to fuel the growth of the institute.

While there is an annual strategic plan for SNRI, there is a need to update the mission and the positioning of the institute. The changing situation in which SNRI is doing its work should be taken into consideration in talking about it, and in thinking about the values and vision that drive its mission. There also would be lasting benefit in the integration of all UC Merced entities and physical and human resources engaged in sustainability of the campus, community and planet. There are many working in the area of ecology, both academically and in the way the campus is built and our region's lands conserved. But we come up short in seeing them as a whole and even shorter in acting in concert. To bring everything and everyone into alignment is a tall order, but SNRI could play a catalytic role in a long-term plan for UC Merced, possibly one which syncs up in timeframe with SNRI's need for a new strategic plan, including business elements, that would guide it from 2016 to 2020.




SNRI AFFILIATES

The Environmental Analytical Laboratory and the Yosemite Field Station are administered and run by SNRI but funded by other campus sources. Both of these budgets reside in the Office of Research's budget.

Environmental Analytical Laboratory (EAL)

The Environmental Analytical Laboratory (EAL) is a multi-user facility on campus. The core facility houses an array of state-of-the-art instrumentation and supporting sample preparation and separation equipment that covers a wide range of analytical needs for measurements of major and trace elements and organic and inorganic compounds. The EAL provides essential analytical resources in support of multidisciplinary and interdisciplinary research and education programs in environmental, biological, earth systems and ecological sciences and engineering.

The mission of the EAL is to facilitate campus wide research and education programs and foster inter- and multidisciplinary collaboration among campus researchers and partners in public and private sectors by providing instrumentation and analytical expertise.

The EAL annual budget is $175,000 and is projected to grow at approximately 2.5 percent per year over the next five years.

The Yosemite Field Station (YFS)

The Yosemite Field Station is located in the historic village of Wawona just inside the south entrance of Yosemite National Park. It is dedicated to facilitating synergistic links among science, art, education and natural resource management. The YFS annual budget is approximately $175,000 and is projected to grow $100,000 over the next five years due to growth in personnel.

Below are two summer programs that use its facilities:

Yosemite Leadership Program (YLP)

YLP is a two-year co-curricular program that includes a summer internship in Yosemite for UC Merced undergraduates, offering opportunities such as serving as bilingual interpretive rangers leading tours of the giant sequoias, managing invasive weeds in the park, saving lives as part of the Yosemite Search and Rescue Team and working with nonprofit park partners. Major support for the program has been provided by the Yosemite Fund and Yosemite Association and through generous grants from the Toyota Foundation, Morgan Stanley and the Edward and Marion Doherty Endowment.

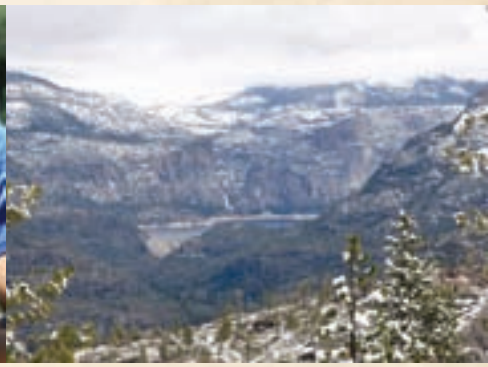
Adventure, Risk, Challenge (ARC)

ARC is a UC Berkeley and UC Merced innovative literacy and leadership program for high school youth, linking wilderness to academics, adventure to leadership, and environmental science to literacy and confidence to activism. The transformative year-round program improves academic skills, exposes youth to a range of natural environments and wilderness experiences, and inspires the confidence they need to envision and accomplish goals, succeed in high school, attend college and become engaged, empowered citizens.

Center for the Information Technology in the Interest of Society (CITRIS)

UC Merced is a part of the Center for Information Technology in the Interest of Society (CITRIS), which also includes UC Davis, UC Santa Cruz and UC Berkeley. The center brings IT solutions to improve the economy, environment and community health and well being. CITRIS is a partner in the Southern Sierra Critical Zone Observatory, which is led by the Sierra Nevada Research Institute. A number of UC Merced faculty affiliated with SNRI are working on grants from CITRIS, and are expected to benefit from CITRIS development efforts.





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THE SIERRA NEVADA RESEARCH INSTITUTE
Strategic Plan, Academic Year 2011-12

Mission

The mission of the Sierra Nevada Research Institute is to discover and disseminate new knowledge that contributes to sustaining the environment and ecosystems of California, and related regions worldwide, through integrated research in natural science, socia1 science, and engineering. This mission is accomplished through:

- Collaborative, multidisciplinary research conducted by faculty, students, and staff from multiple schools and graduate groups at UCM;
- Strong interactions with related research units within the UC system and close collaborative relations with scientists and managers at national laboratories and local, state, and federal agencies;
- Creation of research facilities on the UCM campus and within the Central Valley and Sierra Nevada regions of California;
- Sharing of research results, data and information with public and private stakeholders in the region through publications, forums and workshops;
- Fostering links between understanding of the natural environment, cultural understanding and management of natural resources in the region.

Background

The Sierra Nevada is known for its spectacular landscapes and its many recreational and natural resources. It both provides water that sustains the state's $1.6-trillion-dollar economy, and houses unique biological resources. The eight-county San Joaquin Valley, part of California's Central Valley, the Sierra Nevada watershed, is home to 5 of the 10 most agriculturally productive counties in the United States. By a wide range of indicators, the San Joaquin Valley is also one of the most economically depressed regions of the United States.

All of California is legendary for its vast natural resources, physical and biological diversity and cultural heritage. However, climate change; rapid population growth; competition for natural resources; air, water and soil; human exposure to anthropogenic pollutants; and competing, unsustainable land uses pose serious threats to the sustainability of these attributes of the state.

Over the next twenty years the populations of the San Joaquin Valley and Sierra Nevada Regions are projected to increase by 2.5 million and 1 million residents, respectively; a rate nearly 20% higher than the projected statewide average. Population growth in the San Joaquin Valley could convert 20% of current cropland to urban use by the year 2040. Low density housing in the Sierra foothills could consume half of all private land in the region by 2040, fragmenting habitats and creating enormous safety concerns due to wildfire. Public lands are also under increasing pressure. For example, Yosemite National Park now accommodates between three and four million visitors every year, including nearly one-quarter million overnight stays.

Since 1990, there have been repeated calls for a Sierra Nevada research center within the UC that could help address regional ecological and social issues by conducting and coordinating regionally focused, issue-oriented research while disseminating data, information and analytical tools to local stakeholders. Moreover, population growth, land use change, and environmental sustainability are issues not just for California, but also for most areas of the globe. Thus, although regionally focused, the Sierra Nevada Research Institute pursues research in principles and theories that are applicable elsewhere. SNRI research is also promoted through comparative studies in other regions, through cooperative research and exchange programs, and through formal agreements.

The Sierra Nevada Research Institute has thus far been and will continue to be a boon to the campus by supporting faculty recruitment efforts of the schools, while signaling UCM's commitment to innovative, multidisciplinary research and teaching programs that are rooted in the region. Importantly, the SNRI also fosters lasting, synergistic relationships between the campus and County, State and Federal agencies, as well as the private sector.

Membership

During academic year 2010-11, 27 UC Merced faculty were members of SNRI, and 26 research scientists affiliated with SNRI. The faculty have affiliations in the three Schools, and with seven of UC Merced's nine graduate groups and programs. Faculty members for 2010-11 were:

Andres Aguilar	Martha Conklin	Tom Harmon	Peggy O'Day
David Ardell	Michael Dawson	Stephen Hart	Wolfgang Rogge
Roger Bales	Benoit Dayrat	Kathleen Hull	Samuel Traina
Michael Beman	Henry Forman	Robert Innes	Anthony Westerling
Asmeret Asefaw Berhe	Carolin Frank	Lara Kueppers	Roland Winston
Elliott Campbell	Teamrat A. Ghezzehei	Teenie Matlock	Jeff Wright
Yihsu Chen	Qinghua Guo	Valerie Lepppert	

SNRI faculty and researchers continue to be very productive in obtaining grants, largely from federal and state agencies. Averaged over a four-year period, awards to SNRI faculty amounted to 41% of total campus research awards. Several of the research projects are collaborative with colleagues from other campuses and government research organizations, significantly expanding the impact of SNRI. Following is a summary of awards by year.

Item	Amount per FY, dollars				Percent of total			
	07-08	08-09	09-10	10-11	07-08	08-09	09-10	10-11
Extramural grants	16.4	14.2	21.9	17.4	–	–	–	–
Research grants	11.3	14.0	19.7	15.0	100	100	100	100
Research grants to SNRI faculty[a]	6.2	3.5	7.2[a]	6.8	55	25	37[a]	46

[a]Does not include $2.25 million award to R. Winston for California Solar Technology Institute (48% of research grants with that award)

Research focus areas

The faculty define some focus areas, or areas that build the Institute's and University's reputation and research portfolio. SNRI faculty have also identified opportunities to develop additional research foci. Four major focus areas are described, followed by some additional smaller areas of focus that contribute to SNRI's foundational programs.

Climate and hydrology. UC Merced plays a leadership role in multiple aspects of climate and hydrology within the UC system and nationwide. Our climate applications work fills a critical niche in the UC system, connecting fundamental climate science with climate impacts, mitigation and adaptation. The Sierra Nevada and Central Valley offer outstanding opportunities as natural laboratories for research. Together, they offer the research infrastructure and settings to study many of the challenges facing the nation. For example, the snow-dominated hydrology of the Sierra Nevada makes the range particularly vulnerable to climate change. The vast Central Valley, heavily developed for irrigated agriculture, has extensive areas with declining groundwater levels, saline and nutrient-laden wastewater streams, contaminants leaching from soils, and crops that are sensitive to temperature shifts. The hydrology and climate of the Sierra Nevada and Central Valley have generally received much less research attention than have these topics in coastal California and the Sacramento-San Joaquin Delta, and the need for new knowledge and technology transfer is very large. UCM is beginning to fill a critical niche in the research community and the state through its hydrology, water quality and climate research in the region. Research needs that could be filled by new faculty include climate applications to water resource management, hydroelectric infrastructure management, public health and infectious diseases, air pollution management, and agriculture and forestry. Climate applications include climate-sector interactions, forecasting climatic influences by sector at monthly, seasonal and interannual timescales, climate change impact assessment, and strategies for climate change adaptation and mitigation.

Ecology and ecosystem science. UC Merced is poised to play a leadership role in the ecology and ecosystem science community in California and the nation. Again, the Sierra Nevada and Central Valley offer outstanding opportunities as natural laboratories for research. Ecosystems are undergoing rapid change, in response to the dual pressures of climate change and land use change, both driven by aspects of population growth. Sierra Nevada forests, which are both critical habitats for diverse fauna and the source of much of California's water supply, are now especially vulnerable to catastrophic wildfire. Extended dry periods under a more variable and changing climate will further stress these ecosystems, through reduced evapotranspiration, greater susceptibility to pests and disease vectors, and shifting fire and recovery patterns. Over the next few decades the Central Valley will undergo extensive and enormous ecosystem restorations activities, involving investments of several billion dollars. Water now used for agriculture will be diverted to sustain wetlands and riparian areas, and new entities will be established to manage these large tracts of land. In both the Sierra Nevada and Central Valley, the scientific knowledge base for ecosystem management is weak. Yet the potential ecosystem services to be derived from these areas is enormous and absolutely critical to the state's economy and quality of life. Additional hires of tenured faculty are needed, both at UC Merced and in the

UC system; however, we are unaware of efforts by other UC campuses to add faculty who will use the SNRI region as a base for their research.

Air pollution and public health. The San Joaquin Valley has the distinction of having the worst air quality in the nation. The population of the region is growing more rapidly than in any other air basin in the state, bringing with it increases in vehicle miles traveled and urbanization. Climate change impacts are also expected to worsen air pollution in the region These factors counteract progress in emission reductions, threatening to give the San Joaquin Valley the nation's worst air quality. Without further action, the problem will only get worse. Poor air quality is affecting the region's public health, economy and general quality of life. These problems make the Central Valley and Sierra Nevada region an excellent natural laboratory for air pollution and environmental health research. Further, research has the potential to have important and direct impacts on public policy. Air pollution sources are diverse and only partially understood. While there is a good general knowledge of health effects in the region, details of causes, mechanisms and impacts of mitigation are poorly known. Two additional connections between health and the environment are important in the region and nationwide: climate-health links, and water-health links. UCM has a pivotal role to play in building the knowledge base on the science of air pollution, its health effects and engineering solutions.

Environmental economics, policy and management. Social science aspects of ecosystems and the environment also offer multiple, unique opportunities for research in the Sierra Nevada-Central Valley region. Again, the combination of population growth, land use change, land-cover change and climate warming interact to place unprecedented stresses on existing infrastructure and institutions. While Sierra Nevada forests have traditionally been managed for timber, recreation and habitat, two main economic issues are water supply and hydropower, and a major new issue now on the policy agenda is management of Sierra Nevada forests for sustainable carbon sequestration. Hydropower generates considerable direct revenue, and the Sierra Nevada water supply is essential for the state's economy. Research in environmental and resource economics, policy and management is sorely needed to develop and explore valuation issues, markets, incentives, institutions, capacity building, social attitudes and ecosystem sustainability. Sustainable development of the Central Valley in response to population pressures poses multiple challenges, for transportation, air quality, public health, land use, energy, cultural heritage, and their intersections with political, social and cultural values. UC Merced is poised to develop research programs that will both build a knowledge base that will benefit regional decision makers, and also provide general insight into issues relevant across the nation.

Additional foundational areas and opportunities. In addition to the above four major areas of focus for the institute, SNRI faculty are known nationally and internationally for research in biogeochemistry, environmental engineering, anthropological archaeology, environmental fluid mechanics, glaciology, renewable energy, soil science and materials science.

Organization

SNRI personnel include a faculty director (appointed by the Chancellor), affiliated faculty, executive director, researcher scientists, support staff, postdoctoral researchers, and student researchers. Note especially that researchers supported by grants play a critical role in defining breadth and depth of SNRI's programs. Visiting scholars are also expected to play an important role. SNRI is designed to support the overall development of UC Merced. This requires close coordination with other UCM campus development efforts, and has included recruiting some established leaders for the SNRI faculty. These individuals are helping to build programs in their respective disciplines, thereby ensuring that the Institute is integrated into the larger intellectual enterprise of the campus.

The SNRI is organized around an integrated systems model. This model combines the earth sciences (hydrosphere, cryosphere, lithosphere, atmosphere), with biological sciences (biosphere, ecology, molecular biology, genomics), engineering (environmental, systems, computer) and social science (economics, policy, sociology, anthropology) in integrated studies of multi-faceted problems at the systems level. Through these balanced research efforts, SNRI aims to serve as a source of objective scientific information as California faces the growing challenge of sustaining the integrity and quality of its human and natural resources into the future.

The Institute functions as an Organized Research Unit (ORU), in which the Director (a tenured faculty member) holds a fulltime appointment, and whose ladder-rank faculty researchers hold full appointments in their respective Schools. SNRI has adopted bylaws governing membership in and affiliation with SNRI.

SNRI has a formal advisory committee appointed by the chancellor, an internal users committee for its Environmental Analytical Laboratory, a membership committee, and plans for an external advisory committee.

University-supported positions. The memo of December 17, 2007 from the UCM Chancellor establishing SNRI as an organized research unit (ORU) envisioned a transition to a budget level based at least in part on indirect cost return. At present SNRI operations are largely supported by state funds, with some fraction of facilities that SNRI oversees supported by recharge and user fees.

The success of research and educational activities nurtured by SNRI depends on adequate staffing to cover administrative, laboratory and operations support: Current SNRI staff consist of an SNRI faculty director, executive director (50% as of Jan 2012), management services officer (shared with Office of Research), administrative analyst, administrative assistant, field station mamager, Environmental Analytical Lab manager, and field station maintenance manager.

With the formation of SNRI as an ORU and scope of program building activities underway, the demands for administrative support continue to greatly exceed what SNRI staff can provide. The level of administrative support needed for supporting grants has grows significantly each year, as does demand for coordinating meetings, scheduling appointments, handling correspondence, tracking vehicles, supporting facilities, assisting with hiring, assisting with financial transactions, managing business operations and operating the SNRI office. New initiatives include expansion of SNRI field facilities, establishment of some as UC Natural

Reserves, setting up policies and procedures for SNRI, addition of new faculty to SNRI, and increases in the level of most other SNRI activities. One additional position is needed now to further support the research expenditures and research accounting of SNRI faculty, research scientists and students.[1] Additional positions needed to support growth in progress Campus Reserve manager and a Sequoia/Kings Canyon station manager (0.75 FTE).

Research positions. As an ORU, SNRI offers an academic home for research scientists who are not tenure-track faculty and offers appointments to project-related personnel, career-track research scientists and scientists from outside UC Merced. Project-related personnel will include post-doctoral researchers and research staff with appointments of one or more years. SNRI also serves as home for a select group of career-track researchers who provide important continuity and breadth to SNRI research programs. These researchers are largely supported by contracts and grants, with supplemental support for teaching selected courses. They are also involved in supervising graduate students, supported on their grants. One immediate challenge concerns how SNRI and UC Merced can be a professionally attractive home for these individuals, and provide the continuity of resources needed for them to be successful. Scientists whose primary position is outside UC Merced but who desire an affiliation with SNRI also contribute to our breadth and strength. These include both courtesy (unpaid) and paid appointments. For example, researchers with federal or state agencies, or research industrial affiliates, often complement the disciplines and perspectives of full-time UCM personnel by providing research breadth or research-applications partnerships. It is expected that these affiliates will serve as research collaborators, e.g. co-investigators on grants, co-supervisors of graduate students, supervisors of undergraduate research, and may also contribute to graduate education through workshops or co-teaching courses.

Facilities

The Institute's offices are in the first Science and Engineering (SE1) building, on the UC Merced campus. SNRI has a well-developed field station in Wawona, in Yosemite National Park, a developing field station in Sequoia-Kings Canyon National Parks, and planning is underway for additional field facilities elsewhere in the Sierra Nevada and Central Valley.[2] SNRI-affiliated faculty offices, labs and space for research groups are currently in SE1, in the first classroom building, in the Social Sciences and Management Building, and across town at the Castle facility. Some SNRI faculty share a small field staging facility located at Castle. SNRI research projects use several field sites in the Central Valley and Sierra Nevada region. In order to sustain its research activity, SNRI must look for opportunities for campus research space to supplement that available through the schools. We recommend that in addition, space in one or more of the modular buildings be designated for SNRI-affiliated research offices and laboratories, beyond what is currently assigned or can be accommodated in SE1. This space would accommodate faculty and researchers from all three of UCM's schools who would benefit

1 Discussions continue as to how these services should be organized campuswide. An informal poll of SNRI faculty suggests that there is a strong preference for these services to be provided by SNRI for contracts and grants, rather than by staff assigned to a school dean's office.

2 *Strategic Plan for Field Facilities*, Sierra Nevada Research Institute, UC Merced. August 2008.

by being co-located. SNRI is also exploring opportunities to secure donor-supported space on campus.

SNRI prepared a separate strategic plan for field facilities, outlining an integrated network of facilities along both North-South and East-West in the Sierra Nevada and Central Valley:

- North-South transect – SNRI will focus on establishing facilities on the west slope of the Sierra Nevada. There already exists a strong network of field stations in the Eastern Sierra and in the Central Valley. SNRI field stations will fill a critical gap in research facilities on the west slope of the Central and Southern Sierra. Facilities along this North-South gradient will span important gradients in regional climate, precipitation, and air pollution patterns.
- East-West transects – each field station will provide a base for research along elevation gradients that span from grassland to chaparral to montane to sub-alpine communities. A vernal pool reserve near the UCM campus will complete a larger East-West transect from the Central Valley to the Sierra crest. Research foci will be established by investigator-defined priorities of critical environmental and socio-economic issues facing the broader Sierra Nevada Eco-Region.

Discussions with land owners/managers are ongoing, and it is planned to develop four more facilities over the next few years. In addition to YFS, SNRI will seek NRS designation for some of these facilities. Sites include:

- Sequoia National Park: The goal is to develop a field station in the park, incorporating the current work space with high-speed internet and telephone and a cabin at Wolverton.
- Kings River Experimental Watershed (KREW):) in the Sierra National Forest: The Pacific Southwest Research Station (PSW) of the U.S. Forest Service (USFS) is planning a new year-round research building along Dinkey Creek Road, at the Dinkey Mill site. With a major UCM research program now starting at KREW, plus a NEON presence proposed for the site, the goal is for SNRI to develop UC research space in conjunction with the PSW expansion.
- San Joaquin Experimental Range (SJER): Proposed as the NEON core site for California, SJER is currently operated by the USFS and Fresno State. Discussions with UC colleagues planning NEON in California, and PSW are ongoing. SNRI is taking the lead role in planning and eventually managing the NEON facilities, when funds become available from NSF.
- Campus Reserve: The goal is to enhance research opportunities in the vernal pool ecosystems that are being preserved as part of the campus development. The Trust land is over 6,000 acres, with an adjacent 4,000-acre parcel also protected.

There are two further research infrastructure projects that provide substantial and unique opportunities for research in the region, both of which are in the early stages of implementation:

- CalEON: The California Ecological Observatory Network (CalEON) is a regional network of field sites, natural history museums, and university labs (http://www.caleon.org). One proposed new component of CalEON is near the UC Merced campus. The National Ecological Observatory Network has designated a central California site for a major research infrastructure investment, with SNRI taking responsibility for developing and managing the

facilities. While research will be carried out by researchers from other UC campuses and around the world, the close proximity of the CalEON facilities in the region offers special opportunities for ecological and related research.

– Sierra Nevada-San Joaquin Hydrologic Observatory. SNRI faculty are working with colleagues from other campuses and governmental researchers to build research infrastructure for hydrologic and related research in the Sierra Nevada and San Joaquin Valley. We have established five instrumented research sites on the west slope of the Sierra Nevada and two in the San Joaquin Valley.

Educational activities

Although SNRI will not offer graduate or undergraduate courses, it does nurture a number of educational activities. SNRI faculty contribute to multiple undergraduate degrees and graduate groups. Three-fourths of the SNRI faculty are also members of the Environmental Systems graduate group; overall, SNRI faculty are drawn from six of UCM's nine graduate groups.

The Environmental Analytical Laboratory (EAL) is engaged in the educational mission of UC by providing access to instrumentation for relevant laboratory courses and supporting graduate and undergraduate research.

While the Yosemite Field Station was originally intended to be primarily a physical space that facilitates investigator-initiated projects or class field trips, we have established several funded programs to encourage K-12, undergraduate, and graduate education and research at SNRI. The broader vision for these educational programs is an integrated, inter-generational youth leadership program that creates a pipeline of students at different stages from early high school to recent graduates and graduate students. For example, Adventure, Risk, Challenge (ARC) is a year-round educational outreach program that partners UCM and Yosemite National Park with public high schools and underserved communities of the Central Valley to engage English language learner (ELL) high school students. Undergraduate programs are also hosted by YFS, including UC Merced's signature Yosemite Leadership Program (YLP). This program provides UC Merced undergraduates with diverse internship opportunities in Yosemite that range from serving as bilingual interpretive rangers leading tours of the giant sequoias, to managing invasive weeds in the park, to saving lives as part of the Yosemite Search and Rescue team.

Future faculty needs

SNRI draws faculty from all of UCM's schools. Research that SNRI faculty, research scientists and their groups are pursuing, and the graduate and undergraduate degree programs associated with them, span the university. Thus, long-range planning requires a university-wide view of programmatic development and needs. The faculty hiring plan is derived from the need for balanced growth among the thematic areas described above, graduate and undergraduate teaching demands, and identification of cross-school and cross-discipline hires that support multiple degree programs and research areas. The following are the SNRI priorities for faculty

hiring. The following table lists priorities and maps these positions onto undergraduate teaching in the schools, and possible graduate group affiliations.

Recommended positions are grouped in four areas, with approximate priority ranking within each area. That is, the positions higher in the list are highest priority for filling immediately, while ones lower in the list could be deferred to a later year. In each area two highest priority positions are identified. Nevertheless, all positions listed would make important contributions toward building our vision of a vigorous, balanced and relevant research portfolio at UCM. We hope that through strategic partnerships with undergraduate majors, graduate groups and planned institutes we can achieve this.

Summary of faculty hiring priorities[a]

Area[a]	Possible undergraduate teaching				Possible grad group
	SoNS	SoE	SSHA	SoM	
Climate & hydrology					
→ Ecological engineering or ecohydrology		x			ES, BEST
→ Climate: paleoclimate or atmospheric dynamics	x				ES
Earth surface processes	x	x			ES
Hydrometeorology	x	x			AM, ES
Ecology & ecosystem science					
→ Ecological or ecosystem modeling	x				ES
→ Global change ecology or paleoecology	x				ES
Wildlife conservation biology	x				ES
Ecology of infectious diseases	x				QSB, ES
Air pollution and public health					
→ Air pollution, modeling, management & control		x		x	ME, ES
→ Environmental health or epidemiology	x				ES, BEST, QSB
Environmental toxicology	x				QSB
Environmental health policy	x			x	SCS
Environmental economics, policy & management					
→ Natural resources management				x	ES, SCS
→ Environment and society			x	x	SCS, WC
Sustainability & land use planning		x	x	x	SCS, ES
Environmental ethics			x	x	SCS, WC

[a]→ arrow indicates position is highest priority

Brief description of highest priority areas:

→ ***Ecological engineering or ecohydrology***. We recommend an assistant or associate level search for a faculty member who uses engineering principles to design sustainable systems that integrate human activities with the natural environment**,** with particular emphasis on the linkage between hydrologic and ecological systems. Possible areas of research emphasis include interactions among hydrologic, biogeochemical, physiological, and soil processes;

hydrologic ecosystem services, integrating water quality, water cycling; spatial analysis and scaling. Use of remote sensing, field-based measurements, laboratory experiments and modeling are all of interest. As a discipline, ecohydrology addresses the bi-directional regulation of hydrologic and ecological processes, e.g., the flow regime and pollutant levels of water in wetlands regulate the species and the populations that live in the ecosystem, while ecological processes in the wetland regulate the timing and magnitude of water and nutrient fluxes through the system. Ecological engineering involves the design, construction, restoration and management of aquatic and terrestrial ecosystems that have value to both humans and the environment, using principles from engineering, ecology, economics, and natural sciences. The extensive and large-scale ecosystem restoration efforts planned in the Central Valley provide excellent opportunities for both natural laboratories, and research support through applications partnerships with local landowners and conservation entities. Similar efforts are being carried out across the Western U.S.

→ ***Climate: dynamics or paleoclimate***. We recommend an open rank search for a faculty position with research on climate and environmental changes on a variety of time scales, but with particular emphasis on the Holocene. Research could focus on paleoclimate data analysis, climate dynamics/modeling, field/laboratory studies or some combination. In the modeling area, research could address theoretical or modeling aspects of synoptic and/or mesoscale processes, or could combine knowledge of atmospheric dynamics with expertise in global or regional climate modeling. The position is also central to sustaining and building our strength in climate applications.

→ ***Ecological or ecosystem modeling***. We recommend an assistant or associate professor search in the area of ecological or ecosystem modeling. Mathematical models and systems analysis are frequently used to describe population, community, and ecosystem dynamics, and for the control of environmental pollution and management of resources. Research areas could include population and species interactions, ecological responses to global change, forest ecosystem dynamics, or agroecosystems. This position would provide a strong complement to other positions emphasizing field observation and experimentation, including searches in progress, ecohydrology, restoration ecology, global change ecology and others.

→ ***Global change ecology or paleoecology.*** We recommend an open rank search, with an emphasis on ecophysiology, invasive species or ecosystem processes. Agroecology is another possible area of emphasis. Paleoecology provides necessary context to ecological management, and paleoecological field methods are a critical component for graduate programs in environmental systems and ecology.Someone who works on the effects of human activities on remaining grassland systems would also be of particular interest. The Sierra foothills and San Joaquin valley offer tremendous natural laboratory opportunities, including research infrastructure, linkages with research by land management agencies and applications partnerships.

→ ***Air pollution modeling, management and control.*** We recommend an assistant or associate professor position, preferably someone with both a management and technology focus in the area of air quality engineering. A background in mechanical engineering is desirable. This

position could focus on engineering design of systems, technology for air pollution control, or modeling and impacts of air pollution. California's Central Valley offers an excellent natural laboratory for research to devise air pollution control systems. Organic and inorganic particulates, persistent organic pollutants, and precursor gases for ozone formation are produced during routine agricultural practices and weekday commutes. These pollutants are lofted into the atmosphere to interact with other chemicals or microbes and are eventually deposited in the respiratory systems of humans and animals, as well as on plant leaves. The resulting effects on human and ecosystem health are devastating. A significant air pollution-related research effort aimed at the understanding and mitigating the escalating air quality problems in the Central Valley, Sierra Nevada, and elsewhere has already been initiated in the Environmental Systems graduate group. This new position could also be helpful in understanding the effects of air quality on climate and of climate policy on air quality. ***Environmental health or epidemiology. This posi***tion contributes to an environmental health/air pollution focus. This person should be either a biostatistician/epidemiologist and/or molecular epidemiologist. Priorities would be for research focusing on asthma, lung cancer or cardiovascular disease as these are major problems associated with air pollution, which are the leading causes of health problems with major financial impact on the San Joaquin Valley. This position is an excellent complement to research of Forman, Traina, and Leppert, and as well as the two other proposed environmental health positions. The teaching role for this person could be in statistics, molecular biology or physiology dependent upon their expertise. As this would be the first epidemiologist, a senior position is recommended.

→ ***Natural resource management***. It is recommended that a tenured faculty member at the full or associate professor level be hired in this area. It is expected that this person would help lead the planning for a natural resources management track within the proposed management program and eventual School of Management. A research emphasis on water, forest, or range would complement existing faculty and help fill an important niche in the UC system. This person could also contribute to planning for a Center for Spatial Analysis that is being investigated by faculty in SoE and SSHA, contribute to developing a Geography degree at UCM, and contribute to refocusing of the Earth Systems Science degree in the School of Natural Sciences. At the graduate level, a number of discussions have taken place around starting a program in Public Lands Management, with linkages to the NPS, USFS and other land-management agencies; and this person could also anchor that program.

→ ***Environment and society*****.** Natural disasters and ecosystem change are fundamental processes that occur without human influence, but most environmental process are affected by and affect humans and their social organizations. Technical solutions currently exist for many environmental problems, but they cannot be implemented without consideration of the human dimensions of the environment, including the diverse values, understandings, and perceived needs of various constituencies. A mid-career or senior faculty member in the area of environment and society would be invaluable to the SNRI, providing leadership in our research and educational efforts in this area. As noted in the Sierra Nevada Ecosystem Project, such research might encompass approaches to integrative adaptive management, or alternatively, consider diverse issues such as environmental justice and the place of "clumsy

institutions" in environmental politics and policy. Collectively with Professors Chen, Hull and Westerling, this position in SSHA would build the social sciences core at UC Merced in the broad area of environmental social sciences. This combination of positions would create a core of excellence that could contribute to the research agenda of SNRI as well as the management program. Finally, this position would contribute greatly to the development of a cross-school undergraduate minor and/or major in the environment.

Brief descriptions of the second priority positions:

- ***Earth Surface Processes*.** Quantitative study of physical processes at and near the Earth's surface, including areas such as process geomorphology, landform/landscape evolution and forecasting, land surface geochronology, sediment transport/hydrogeology, and land use-ecosystem interactions. Many individuals in this field are employing remote sensing and GIS methods, as well as surface age dating and other geochemical approaches that would interface well with SNRI initiatives, as well as supply much needed expertise in physical surface processes. This is a critical area that can help provide integration among current SNRI strengths in hydrology, geochemistry/biogeochemistry, ecosystem science and spatial analysis. This type of individual would strongly contribute to graduate research in Environmental Systems and to the development of an interdisciplinary cross-school major. The position could also be central to our strengths in climate applications.
- ***Hydrometeorology***. We recommend an assistant professor position with a research emphasis on precipitation processes, boundary-layer meteorology, meteorological hazards, environmental/atmospheric fluid mechanics and/or climate change impacts on extreme hydrologic events. Due to the extensive coupling between the atmosphere and hydrosphere, it is necessary to consider the entire system in order to understand the role of individual components. Research in hydrometeorology is expected to focus on environmental prediction, at scales that are relevant for engineered systems such as dams, levees, drainage networks, transportation networks and urban development. This position could build our strength in climate applications for the region's water resources.
- ***Wildlife conservation biology***. We recommend an open rank search, with an emphasis on research opportunities in the Sierra Nevada and/or Central Valley. The need for an ecologist who can bring modern techniques to the study of wildlife populations is great, and not being met by other campuses. The timing is particularly critical, given the habitat changes that will result from climate change and land use change, plus the active restoration activities in the region. Priority research areas include: population biology, behavioral ecology, conservation, behavioral endocrinology and evolutionary ecology. We should seek an individual whose research is based on field studies (including GIS), generally using observational rather than experimental methods.
- ***Ecology of infectious diseases***. We recommend an open rank search for a person who will focus on understanding the ecological and biological processes that govern relationships between human-induced environmental changes and the emergence and transmission of infectious diseases. This is an interdisciplinary research area that will draw upon both ecological and biomedical methods to study how environmental events-such as habitat

alteration, biological invasion, climate change and pollution-alter the risks of emergence and transmission of viral, parasitic, and bacterial diseases in humans and other animals. Prediction and control are of primary importance. Infectious disease agents affect all living organisms, can have complex life histories involving multiple species, and can be specialists or generalists in terms of host preference. The interface between humans and both domestic and wild animals is a region rife with opportunity for emerging diseases – those that were not pathogenic in the original host, but are in the new host (e.g., Hantavirus, SARS). Evolution of infectious agents and their plant and animal hosts is also a critical component of research for understanding the ecology of infectious disease. UCM is uniquely positioned for research in this area, literally located in the transition zone between suburban, agricultural and natural ecosystems. Migratory birds use Central Valley agricultural fields as stopover points, and human migration supports the agricultural industry. Air pollution can make stressed organisms more susceptible to infection.

- ***Environmental toxicology***. This position contributes to an environmental health focus. This person should be either a biochemist/molecular biologist or pathophysiologist. Priorities would be for research focusing on air- and water-borne toxicants as these are major issues in the San Joaquin Valley. This position is an excellent complement to research of Forman, Traina, Leppert, Rogge and O'Day as well as the two other new environmental health positions. The teaching role for this person could be in biochemistry/molecular biology or physiology dependent upon their expertise. An open search is recommended.
- ***Environmental health policy***. This position contributes to an environmental health/air pollution focus. This person should be a health economist/political scientist. The greatest obstacle to implementing the clean air act in the San Joaquin Valley is probably not the availability of technology. Rather, understanding and resolving the economic and political implications of compliance appears to be the major problem. Balancing the economic, political and health implications while interacting with scientists and engineers who are bringing new information to the table would be the goal of this individual. The teaching role for this person could be in economics or political science dependent upon their expertise. A senior search is recommended as this is a new area.
- ***Sustainability and land use planning***. We recommend an open-rank search for an individual who will contribute to an emerging focus at UCM in sustainable development, with this focus on community development and land use. Land use planning will play an important role in both climate change adaptation and mitigation strategies, and this position could help to build climate applications capacity at UC Merced that supports policy making in the state and nationally. This position could link to the proposed restoration ecology, conservation biology, air pollution management, environmental health policy, and resource management positions, as well as to current faculty. There are multiple opportunities for applications partnerships in the region, particularly associated with the recently initiated, long-term valley-wide planning activity.
- ***Environmental ethics***. A cross-disciplinary position intended to foster interdisciplinary understanding of human life in relation to the natural world. Such a position might identify

and analyze ways in which culturally constructed representations of Nature (e.g., in literature, the arts, popular culture, scientific and social scientific rhetoric, environmental discourses, and everyday common sense) shape the ethics of human interactions with the natural environment and shape perceptions of environmental problems and solutions. Specific areas might include environmental law, diplomacy, trans-national activism, natural resource use, global change, sustainable development, biodiversity, and transboundary pollution control, even extending to consider cultural assumptions and social models embedded in the language of environmental science and the policies and practices surrounding the term environmental justice.

Sierra Nevada Research Institute - *Proposed areas of support for investments*

The following table highlights current funding areas reflecting the Strategic Academic Vision (SAV) and additional potential areas of support for the Sierra Nevada Research Institute

Focus Areas (In Priority of Impact)	Impact	Investment
Endowed Chair for Forest and SJV Hydrology – SNRI Chair resides in the School of Engineering	Supports the research of a renowned faculty member in forest hydrology, management and policy. This Chair would be transformative for all of California and the UC system. No such chair exists in any California research universities. This represents an urgent need for water research in California.	Endowment: $1 – 3 Million Annual: $90k-120k
Endow SNRI Director	A named Director for SNRI, a prestigious position within UC Merced.	Endowment: $1.5 Million Annual: $60k
Visiting Professor/Scholar	Entice a renowned Professor from another institution to join SNRI for one year. Adding strength in an SNRI research area	Endowment: $1 Million Annual: $40k
Scholarships and Student Success	Enables University to support and recruit students, ranging from merit to need based opportunities.	Current: Minimum of $1,000 per year/student Endowment: $500,000 (Named Scholarship)
Graduate Student Fellowships	Enables recruitment of top graduate students in a given field. Provides critical research. Support for faculty, including recruitment and retention.	Current: $50,000 per year/graduate Endowment: $500,000 (Named Fellow)
SNRI Facilities	Naming Opportunities = Permanent sustained funding for critical facilities and programs within SNRI. Long term benefit for the future of the San Joaquin Valley and the Sierra Nevada.	
Sierra Nevada Research Institute	Focus research on critical needs of forest, water and other ecosystem services. For example, provides support to develop a new water information system for Sierra Nevada watersheds to provide unprecedented real-time information regarding snowpack amounts and timing/amount of run-off. This information will be vital for industry, communities and agriculture in water management strategies and is critical in this time of climate change.	Endowment: $5 -10 Million
San Joaquin Valley Groundwater Observatory	Water Information System for watershed networks from the crest of the Sierra Nevada to the west side of the San Joaquin Valley. Researchers create water balance data of surface and ground water systems to inform researchers, managers and decision makers in government, municipal, private and regulatory settings.	Endowment: $1-5 Million Annual: $40k – 200k
SNRI Green House	Provides state of the art greenhouse on campus for experimental and research applications for the Sierra, Foothills and San Joaquin Valley research.	Endowment: $1 Million Annual: $40k
Yosemite Natural Reserve and Research Facility	Endowment funds critical needs for research, to increase opportunities and quality of research for student, visiting researchers and faculty researchers in a premier National Park setting.	Endowment: $1-5 Million Annual: $40k-200k

Sequoia National Park Research Facilities (Wolverton, Giant Forest, Wuksachi)	Endowment makes expansion of research in Sequoia National Park possible. World class research opportunities vital to the Southern Sierra Nevada, foothills and southern San Joaquin Valley will be made possible through support in this area.	Endowment: $1-5 Million Annual: $40k-200k	
San Joaquin and Upper Kings Research Facility	A year round workspace and lodging facilities fulfills a critical need for UC Research facilities in the Southern Sierra Nevada. SJUK Research Facility will be utilized by researchers and faculty from UC Merced and the world. (Big Creek, Shaver Lake)	Endowment: $2 Million Annual: $80k	
Kings River National Ecological Observatory Network (NEON)	Facilities need to be upgraded and maintained to make research in this area possible and attractive. A critical area for additional information on the Southern Sierra air, water and soil systems.	Endowment: $500-$1 Million Annual: $20k-40k	
Yosemite – Nature Bridge Research Facility	Creation of a research facility for SNRI in proximity to the Nature Bridge Facility in Yosemite will offer year-round access for researchers in a premier National Park setting.	Endowment: $1 Million Annual: $40k	
Tulare Basin Natural Reserve	Funding will create a UC Natural Reserve in one of the most critical areas in the Southern San Joaquin Valley. Water, air, soil, social science research opportunities will be invaluable in charting future decisions in the Southern San Joaquin Valley.	Endowment: $2-5 Million Annual: $80k-200k	
SNRI Research Project	Faculty member, area	Project and Impact	Entire Project Cost: Annual Cost:

Note: Namings do not include 5% assessment.

UC Merced visiting Researchers and Students 2010-2015

Student		**University**	NSF 3-year grant
Melissa Anderson	REU Program 2015	University of Minnesota	2013-2015
Hannah Besso	REU Program 2015	Western Washington University	
Anna Chovanes	REU Program 2015	Wheaton College	
Lydia Lichtiger	REU Program 2015	Earlham College	
Megan Seeley	REU Program 2015	University of Wisconsin	
Megan Sidran	REU Program 2015	Lewis Clark College	
Alexandra Stucy	REU Program 2015	Monmouth University	
Eight (8) Students	REU Program 2014	Various	
Eight (8) Students	REU Program 2013	Various	

Professor	**Student/Faculty**	**Institution**
Bales, Roger	Graham Fogg	UC Water/Davis
	Andy Fisher	UC Water/Santa Cruz
	Michael Kiparsky	UC Water/Berkeley
	Hellen E. Dalhke	UC Water/Davis
	Holly Doremus	UC Water/Davis
	Steven D. Glaser	UC Berkeley
	Thomas Harter	UC Water/Davis
	Jay Lund	UC Water/Davis
	Josué Medellín	UC Water/Davis
	Azuara Samuel Solis	UC Water/Davis
	Kevin O'Hara	UC Berkeley
	William Stewart	UC Berkeley
	Carlos Oroza	UC Berkeley
	Ziran Zhag	UC Berkeley
	Zeshi Zheng	UC Berkeley
	Carolyn Hunsaker	CZO/USFS
	Anthony O'Geen	CZO/UC Davis
	Peter Hartsough	CZO/UC Davis
	Naomi Tague	CZO/UC Santa Barbara
	Cliff Reibe	CZO/U Wyoming
	Michael Golden	CZO/UC Irvine
	SNAMP Collaborators	(See Conklin)
Beman, Michael	REU Students	*(See REU above)*
	Jesse Wilson	UC Merced
	Elisabet Perez-Coronel	Universidad La Salle
	Imelda Forteza	UC Merced
	Matt Meyerhof	UC Merced

Professor	**Student/Faculty**	**Institution**

	Molly Carolan	UC Merced	MS 2014
	Kelly Henry	UC Merced	PostDoc
	Sang Park	Yosemite REU (Harvard)	2010
	Julia Cline	Yosemite (UC Merced)	2011
	Victor Velez	Yosemite REU UC Davis	2013
	Koreana Pak	Yosemite REU (Harvard)	2014
	Mark Reynolds	Yosemite (UC Merced)	2014
Berhe, Asmeret	CZO Collaborator	(See Bales)	
Blois, Jessica	Behrensmeyer, Kay	Smithsonian Institution	
	Eronen, Jussi	University of Helsinki	
	Ferrier, Simon	CSIRO (Australia)	
	Fitzpatrick, Matt	University of Maryland Center for Environmental Science	
	Gill, Jacquelyn	University of Maine	
	Gotelli, Nick	University of Vermont	
	Graham, Russ	Penn State	
	Grimm, Eric	Illinois State Museum	
	Jackson, Steve	USGS Southwest Climate Science Center	
	Lawing, A. Michelle	Texas A&M	
	Lugilde, Diego Nieto	University of Maryland Center for Environmental Science	
	Lyons, S. Kate	Smithsonian	
	McGill, Brian	University of Maine	
	McGuire, Jenny	Georgia Tech	
	Mychajliw, Alexis	Stanford University	
	Polly, P. David	Indiana University	
	Williams, Jack	UW Madison	
Campbell, Elliott	Mary Whelen	NSF PostDoc Fellow	2014-present
	Gara Villalba	European Commission Marie Skłodowska-Curie Fellow	
	Tim Hilton	Project Scientist	Present
	Yaqiong Lu	Post Doc - Chinese Academy of Sciences	
	Jim Stinecipher	Chancellor's Grad Fellow	PhD - present
	Andrew Zumkehr	Grad Student - UCM	present
	Brandi McKuin	Grad Student - UCM	present
Chen, Yihsu	Not available		
Professor	**Student/Faculty**	**Institution**	
Chen, YangQuan	Brandon Stark	UC Merced -	PhD student
	Brendan Smith	UC Merced -	PhD 2013

	Tiebiao Zhao	UC Merced -	PhD 2013
	Marwin Ko	UC Merced -	MSc -2013
	Duval Johnson	UC Merced -	PhD 2014
Conklin, Martha	UC Water collaborators	*see Bales*	
	CZO collaborators	*see Bales*	
	John Battles	UC Berkeley/SNAMP	
	Maggie Kelly	UC Berkeley/SNAMP	
	Steve Stephens	UC Berkeley/SNAMP	
	Lynn Huntsinger	UC Berkeley/SNAMP	
Dawson, Michael	Liza Gomez Daglio	Centro Interdisciplinario de Ciencias Marinas-IPN, Mexico	2007-present
	Holly Swift	UCLA	2007-present
	Sabah Ui-Hasan	University of New Hampshire	2015 - present
	Lauren Schiebelhut	UC Merced	2010-present
	Sarah Abboud	Northeastern University	2011-present
	Mariana Rocha de Souza	UniversitéAix Marseille, France	2014-present
Diaz, Gerardo	Sergio Pienda	UC Merced	2013-PhD
	Neeraj Sharma	UC Merced	2014 PhD
	Andres Munoz	UC Merced	PhD prgrm
	Vivian Duong	UC Merced	MS prgrm
	Viacheslav Plotnikov	UC Merced	PhD prgm
Fogel, Marilyn	Alexander, Conel	Carnegie Institution of Washington	
	Miller, Gifford	University of Colorado	
	Misc.	Stroud Water Research Institute	
	Steele, Andrew	Carnegie Institution of Washington	
Frank, Carolin	Albalasmeh, Ammar	Jordan University of Science and Technology	
	Dana Carper	UC Merced	PhD 2013-present
	Paola Saldierna	UC Merced	PhD 2015-present
	James Kupihea	UC Merced	PhD 2015-present
	Jorge Montiel	UC Merced	PhD 2015-present
	Dr. Alyssa Carrell	UC Merced	PhD 2014
Ghezzehei, Teamrat	Bayala, Roger	Institut Senegalais Pour la Recherche Agricole	

	Berli, Markus	Desert Research Institute, Nevada	
	Carminati, Andrea	University of Gottingen	
	Dijkema, Jelle	Wageningen University and Desert Research Institute	
	Furman, Alex	Technion Institute, Israel	
	Moret, David	Consejo Superior de Iinvestigaciones Cientificas	
	Sancho, Carolina Pena	Consejo Superior de Iinvestigaciones Cientificas	
	Van Der Ploeg, Marine	Wageningen University	
	Van Genuchten, Rien	Federal University of Sao Paolo	
Guo , Qinghua	SNAMP	(*See Conklin)*	
Harmon, Tom	Allen, Michael	University of California Riverside	
	Ayllon, Roxanna	Universidad Austral de Chile	
	Chandra, Sudeep	University of Nevada Reno	
	Conde, Daniel	Universidad de la República, Uruguay	
	Escobar, Jaime	Universidad del Norte, Colombia	
	Hanson, Paul	University of Wisconsin	
	Helman, Michal	University of Montana	
	Hoyos, Natalia	Universidad del Norte, Colombia	
	Jones, Stuart	University of Notre Dame	
	Longo, Maria Clara	Universidad Nacional del Sur, Argentina	
	Oberbauer, Steve	Florida International University	
	Perillo, Gerardo	Instituto Argentino de Oceanografía & UniversidadNacional del Sur, Argentina	
	Picollo, M. Cintia	Instituto Argentino de Oceanografía & UniversidadNacional del Sur, Argentina	
	Pinto, Adrian	University of Costa Rica	
	Pai, Henry	UC Merced	PhD Student
	Adhikari, Diganta	UC Merced	PhD Student
	Arroyo, Irvin	UC Merced	PhD Student

Professor	Student/Faculty	Institution	
Harmon, Tom	Reid, Brian	Centro de Investigaciones en Ecosistemas de la Patagonia, Universidad Austral de Chile	
	Rundel, Philip	UCLA	
	Rusak, James	Queen's University and Ontario Ministry of the Environment	
	Schwendenmann,Luitgard	University of Aukland, New Zealand	
	Scordo, Facundo	Universidad Nacional del Sur, Argentina	
	Scott, Dane	University of Montana	
	Silvia, London	Instituto de Investigaciones Económicas y Sociales del Sur	
	Velez, Maria	University of Regina, Canada	
	Wemple, Beverley	University of Vermont	
	Zelikova, Jane	University of Wyoming	
	Zilio, Mariana	Instituto de Investigaciones Económicas y Sociales del Sur	
Hart, Stephen	REU	See above	
	CZO Collaborators	See above	
Leppert, Valerie	Aaron Cowles	UC Merced	Phd candidate
	Kevin Mercurio	UC Merced	Phd candidate
	Kennedy Nguyen	UC Merced	PhD candidate
	Gayatri Premasekharan Kamthe	UC Merced	PhD 2012
Hull, Kathleen	Shannon Acevedo	UC Merced	Grad Student
	Christine Clarkson	UC Merced	MA 2014
	Di Franco	UC Merced	PhD 2014
Joyce, Andrea	Delia Garibay Benitez	University of Guadalajara	Jul-13
	Melany Murillo Torres	University of Guadalajara	Nov-14
Kueppers, Lara	Yaqiong Lu	Chinese Academy of Sciences	Postdoc
	Miguel Fernandez	UC Merced	PD 2013
	Jennifer Wolf	UC Merced	MS 2011
	Greg Vose	UC Merced REU	2013
	Alex Leu	UC Merced	
	Melanie Wiederhold	University of Colorado REU	2012
	Alan Hong	UC Merced	2012

	Ana Becerril	UC Merced	
	Daniella Rodriguez	University of Colorado REU	2010
	Renee Rozaieski	University of Colorado REU	2010
	Marc Wasserman	UC Merced REU	2010
	Ruth Xochihua	UC Merced	2010
	Alyssa Carrell	UC Merced	PhD
Moran, Emily	Samantha Davis	Wright University	PhD
	Mengjun Shu	UC Merced	
	Jeffrey Lauder	UC Merced	PhD student
	Michael Stemkovski	North Carolina University	
	Rhys Ormond	UC Merced	
Professor	**Student/Faculty**	**Institution**	
Moran, Emily	Angela Stathos	University of Montana	
	Cameron Musser	UC Berkeley	
Matlock, Tennie	Emmanuel Vincent	UCM Center for Climate Communication	2015 - Present
	Timothy Gann	UCM Center for Climate Communication	2013-2015
	Perlman, Marcus	UCM Center for Climate Communication	2012 - 2013
O'Day, Peggy	Estela Reinoso-Maset	PostDoc	
	Nancy Birkner	PostDoc	
	Alex Leven	UC Berkeley	Grad Student
	Henry Forman	UCM Founding Faculty	
	Molly Stephens	UC Davis	
Rice, Robert	Butler, Leslie	University of California Davis	
	Steven D. Glaser	University of California Berkeley	
	Horwath, William	University of California Davis	
	Zhang, Ziran	UC Berkeley	
	Steven D. Glaser	UC Berkeley	
Rolland, Eric	1 (no name)	Purdue University	
	1 (no name)	Shanghai Jiaotong University	
	1 (no name)	University of Alberta	
Sexton, Jason	Blackman, Ben	University of Virginia	
	Carscadden, Kelly	University of Toronto	
	Hirst, Megan	University of Melbourne	
	Hoffmann, Ary	University of Melbourne	
	Slatyer, Rachel	University of Melbourne	
Westerling, Leroy	PhD	Pacific Southwest Research Station	
	Alisa Keyser	UC Merced	PhD Candidate

	Kaitlin Lubetkin	UC Merced	PhD
	Ben Bryant	UC Merced	PhD Candidate
Winston, Roland	Constance Chang	UC Berkeley	
	Hasnain	UC Davis	
	Pieter Stroeve	UC Santa Barbara	
	Umesh Mishra	UC Riverside	
	Alfredo Martinez	UCLA	
	Morales	UC Irvine	
	Yang Yang	UC Santa Cruz	
Professor	**Student/Faculty**	**Institution**	
Winston, Roland	Matthew Law	UC Santa Barbara	
	Michael Isaacson	UC Davis	
	Steve DenBaars N	UC Merced	
	Nael El---Farra Ali	UC Merced	
	Javey Sungho	UC Merced	
	Jin Zhaowei Liu	UC Merced	
	Patrick Mantey	UC Merced	
	Adam Moule	UC Merced	
	Sayeff Salahuddin	UC Merced	
	James Speck	UC Merced	
	Daniel Sperling	UC Merced	
	Sadrul Ula	UC Merced	
	Jerry Woodall	UC Merced	
	Ming Wu	UC Merced	
	Eli Yablonovitch	UC Merced	
	Adam Durbin	UC Merced	
	Mark Durbin	UC Merced	
Viers, Joshua	UC Water Collaborator	UC Merced	

SNRI Undergraduates, Graduate Students and Postdoctoral Students 2010-2015

Professor	Student	Institution	Degree	Year	Funding Source
Agular, Andres	Kelly McClintock	UC Merced	M.S.	2012	
Agular, Andres	Andres Martinez	UC Merced	PhD	2013	
Agular, Andres	Jason Baumsteiger	UC Merced	PhD	2012	
Agular, Andres	Joseph Heras	UC Merced	PhD	2013	
Ardell, David	Eva Freyhult	University of Uppsal	Graduate		
Ardell, David	Kyle Kauffman	UC Merced	Graduate		
Ardell, David	Ingemar Ohlsson	University of Uppsal	M.S.		
Ardell, David	Kristoffer Illergard	University of Uppsal	M.S.		
Ardell, David	Jennifer Liberto	UC Merced	PhD		
Ardell, David	Julie Philips	UC Merced	PhD		
Ardell, David	Katherine Harris Amrine	UC Merced	PhD		
Ardell, David	Travis Lawrence	UC Merced	PhD		
Ardell, David	Wes Swingley	UC Merced	Postdoc		
Ardell, David	Cristhian Gutierrez Huerta	UC Merced	Undergrad		
Ardell, David	Harkanwalpreet Sodhi	UC Merced	Undergrad		
Ardell, David	Michael Frisch	UC Merced	Undergrad		
Ardell, David	Peter Becich	UC Merced	Undergrad		
Bales, Roger	Brent Harrison	UC Merced	PhD		
Bales, Roger	PeterKirchner	UC Merced	PhD		
Bales, Roger	Ryan Lucas	UC Merced	M.S.		
Bales, Roger	Sarah Martin	UC Merced	PhD		
Bales, Roger	Jim Roche	UC Merced	PhD		
Bales, Roger	Phil Saska	UC Merced	PhD		
Bales, Roger	Lynn Sullivan	UC Merced	M.S.		
Bales, Roger	Glen Shaw	UC Merced	PhD		
Bales, Roger	Fengjing Liu	UC Merced	Postdoc		
Bales, Roger	Christine Hedge	UC Merced	Undergrad		
Beman, Michael	Jesse Wilson	UC Merced	PhD		
Beman, Michael	Elizabet Perez-Coronel	UC Merced	PhD		
Beman, Michael	Emelda Forteza	UC Merced	PhD		
Beman, Michael	Daniela Alonso	UC Merced	Undergrad		
Beman, Michael	Matt Meyerhof	UC Merced	M.S.		
Beman, Michael	Curtis Hayden	UC Merced	M.S.		
Beman, Michael	Molly Carolan	UC Merced	M.S.		
Beman, Michael	Kelly Henry	UC Merced	Postdoc		
Beman, Michael	Sang Park	Harvard	REU		
Beman, Michael	Julia Cline	UC Merced	Undergrad		
Beman, Michael	Elizabeth Perkins	UC Merced	Undergrad		
Beman, Michael	Victoria Velez	UC Davis	Undergrad		
Beman, Michael	Koreana Park	Harvard	REU		
Beman, Michael	Mark Reynolds	UC Merced	Undergrad		
Berhe, Asmeret	Erin Stacy	UC Merced	M.S.		
Berhe, Asmeret	Samule Negusse Araya	UC Merced	M.S.		
Berhe, Asmeret	Ben Lash	UC Merced	PhD		
Berhe, Asmeret	Chelsea Arnold	UC Merced	PhD		
Berhe, Asmeret	Elisabet Nadeu	CEBAS, Spain	PhD		
Berhe, Asmeret	Kimber Moreland	UC Merced	PhD		
Berhe, Asmeret	Lixia Jin	UC Merced	PhD		
Berhe, Asmeret	Morgan Barnes	UC Merced	PhD		
Berhe, Asmeret	Rebecca Lever	UC Merced	PhD		
Berhe, Asmeret	Deoyani V. Sarkhot	UC Merced	Postdoc	2009-2010	
Berhe, Asmeret	Fernanda Santos	UC Merced	Postdoc		
Berhe, Asmeret	Micheael Kaiser	UC Merced	Postdoc	2010-2012	
Berhe, Asmeret	Sebastian Doetterl	Univercity of Ghent,	Postdoc		
Berhe, Asmeret	Yaxian Hu	University of Basel, S	Postdoc		
Berhe, Asmeret	Abigail Dziegiel	UC Merced	Undergrad		
Berhe, Asmeret	Alexander Newman	UC Merced	Undergrad		
Berhe, Asmeret	Jennifer Gurrero	UC Merced	Undergrad		
Berhe, Asmeret	Laura Jelpa	UC Merced	Undergrad		
Berhe, Asmeret	Matthew McClintock	UC Merced	Undergrad		
Berhe, Asmeret	Stephen Ho	UC Merced	Undergrad		
Blois, Jessica	Sarah Brown	UC Davis	Postdoc		
Blois, Jessica	Robert Boria	UC Merced	PhD student		
Blois, Jessica	Danaan DeNeve	UC Merced	PhD student		
Blois, Jessica	Nate Fox	UC Merced	PhD student		
Blois, Jessica	Eric Williams	UC Merced	PhD student		
Blois, Jessica	Zara Batac-Bhatti	UC Merced	Undergrad		
Blois, Jessica	Christopher Jorgensen	UC Merced	Undergrad		

Please note: list for undergrads, grads and post doctoral students is incomplete reflecting availability of records.

Blois, Jessica	Andrea Pelaza	UC Merced	Undergrad		
Blois, Jessica	Joceline Santiago	UC Merced	Undergrad		
Blois, Jessica	Angela Yu	UC Merced	Undergrad		
Blois, Jessica	Kaitlin Maguire		Postdoc		
Blois, Jessica	Juliane Liberto	UC Merced	Undergrad		
Blois, Jessica	Tiana Walker	UC Merced	Undergrad		
Blois, Jessica	Stephanie Yupanqui	UC Merced	Undergrad		
Campbell, Elliott	Andrew Zumkehr	UC Merced	Graduate		
Campbell, Elliott	Brandi McKuin	UC Merced	Graduate		
Campbell, Elliott	Jim Stinecipher	UC Merced	Graduate		Chancellor's Graduate Fellow
Campbell, Elliott	Mary Whelan	UC Merced	Postdoc		Atmospheric Chemistry Program - NSF Postdoc Fellow
Campbell, Elliott	Yaqiong Lu	UC Merced	Postdoc		
Campbell, Elliott	Gara Villalba	UC Merced			European Commission Marie Skłodowska-Curie Fellow
Campbell, Elliott	Tom Hilton	UC Merced			
Chen, YangQuan	Marwin Ko	UC Merced	M.S.	2013	
Chen, YangQuan	Brandon Stark	UC Merced	PhD		
Chen, YangQuan	Brendan Smith	UC Merced	PhD	2013	
Chen, YangQuan	Duval Johnson	UC Merced	PhD	2014	
Chen, YangQuan	Tiebiao Zhao	UC Merced	PhD	2013	
Chen, YangQuan	Adreas Anderson	UC Merced	Undergrad		
Chen, YangQuan	Adrian Hernandez	UC Merced	Undergrad		
Chen, YangQuan	Alejandro Bunag	UC Merced	Undergrad		
Chen, YangQuan	Andres Londono	UC Merced	Undergrad		
Chen, YangQuan	Angelica Ocana	UC Merced	Undergrad		
Chen, YangQuan	Anisa Siva	UC Merced	Undergrad		
Chen, YangQuan	Armand Garcia	UC Merced	Undergrad		
Chen, YangQuan	Avery Berchek	UC Merced	Undergrad		
Chen, YangQuan	Benjamin Bocanegra	UC Merced	Undergrad		
Chen, YangQuan	Blair Macleod	UC Merced	Undergrad		
Chen, YangQuan	Brad Cole	UC Merced	Undergrad		
Chen, YangQuan	Bryan Ludden	UC Merced	Undergrad		
Chen, YangQuan	Craig Berger	UC Merced	Undergrad		
Chen, YangQuan	Daniel Fregoso	UC Merced	Undergrad		
Chen, YangQuan	Daniel Seryani	UC Merced	Undergrad		
Chen, YangQuan	Derek Hollenbeck	UC Merced	Undergrad		
Chen, YangQuan	Eduardo Rojas-Flores	UC Merced	Undergrad		
Chen, YangQuan	Eliezar Vigdorchik	UC Merced	Undergrad		
Chen, YangQuan	Elizabeth Marquez	UC Merced	Undergrad		
Chen, YangQuan	Emery Silberman	UC Merced	Undergrad		
Chen, YangQuan	Fabian Iniguez	UC Merced	Undergrad		
Chen, YangQuan	Fernando Luevanos	UC Merced	Undergrad		
Chen, YangQuan	Forrest Yeh	UC Merced	Undergrad		
Chen, YangQuan	Gerardo Robles	UC Merced	Undergrad		
Chen, YangQuan	Hayley Huerd	UC Merced	Undergrad		
Chen, YangQuan	Hugh Van Camp	UC Merced	Undergrad		
Chen, YangQuan	Huong Phan	UC Merced	Undergrad		
Chen, YangQuan	Ian Ojeda-Vasquez	UC Merced	Undergrad		
Chen, YangQuan	Jan Tanja	UC Merced	Undergrad		
Chen, YangQuan	Jeffery Leung	UC Merced	Undergrad		
Chen, YangQuan	Jesse Vick	UC Merced	Undergrad		
Chen, YangQuan	Jessica Gray	UC Merced	Undergrad		
Chen, YangQuan	Jill Cabantac	UC Merced	Undergrad		
Chen, YangQuan	John Murphy	UC Merced	Undergrad		
Chen, YangQuan	Jonathan Luna	UC Merced	Undergrad		
Chen, YangQuan	Josh McBride	UC Merced	Undergrad		
Chen, YangQuan	Juan Carlos Hernandez	UC Merced	Undergrad		
Chen, YangQuan	Lam Bui	UC Merced	Undergrad		
Chen, YangQuan	Manuel Zaragoza	UC Merced	Undergrad		
Chen, YangQuan	Noor Ahmad	UC Merced	Undergrad		
Chen, YangQuan	Perla Meza	UC Merced	Undergrad		
Chen, YangQuan	Ramces Gonzalez	UC Merced	Undergrad		
Chen, YangQuan	Reef Aldayafleh	UC Merced	Undergrad		
Chen, YangQuan	Salvador Uvalle	UC Merced	Undergrad		
Chen, YangQuan	Stephani Gimble	UC Merced	Undergrad		
Chen, YangQuan	Yoni Shchemelinin	UC Merced	Undergrad		
Chen, Yihsu	Hong Lei Liu	UC Merced	M.S.	2008	
Chen, Yihsu	Brent Harrison	UC Merced	PhD		
Chen, Yihsu	Chi Chung Tsao	UC Merced	PhD		
Chen, Yihsu	Paul Doherty	UC Merced	PhD		

Chen, Yihsu	Richardo Marquez	UC Merced	PhD			
Chen, Yihsu	Tanachai Limpaitoon	Berkeley	PhD			
Chen, Yihsu	Dennis Lee	UC Merced	Undergrad	2009-2010		
Chen, Yihsu	Rudy Maltos	UC Merced	Undergrad			
Chen, Yihsu	Vonke Menardo	UC Merced	Undergrad			
Chen, Yihsu	Yuhei Nunome	UC Merced	Undergrad	2009-2010		
Frank, Carolin	Alyssa Carrell	UC Merced	Grad Student Alumn		2014	
Frank, Carolin	April Willams	Merced College	Grad Student Alumn		2010	Yosemite REU Program
Frank, Carolin	Arielle Reivant Munthers	University of Uppsal	Grad Student Alumn	2013-2014		M.S. Thesis Poject
Frank, Carolin	Ashley Graham	UC Merced	Grad Student Alumn		2010	
Frank, Carolin	Brian Cambra	UC Merced	Grad Student Alumn		2014	
Frank, Carolin	Bridget Schick	UC Merced	Grad Student Alumn	2011-2014		
Frank, Carolin	Caroline Larson	University of Uppsal	Grad Student Alumn		2011	
Frank, Carolin	Christina Celis Pugna	UC Merced	Grad Student Alumn	2013-2014		
Frank, Carolin	Daniel Speljak	University of Uppsal	Grad Student Alumn		2011	M.S. Thesis Poject
Frank, Carolin	Emily Wilson	UC Merced	Grad Student Alumn		2014	NFS Graduate Fellow
Frank, Carolin	Jaberpreet Dhaliwal	UC Merced	Grad Student Alumn	2012-2013		
Frank, Carolin	Jenny Pang	UC Merced	Grad Student Alumn		2013	
Frank, Carolin	Jonna Danielsson	University of Uppsal	Grad Student Alumn		2011	M.S. Thesis Poject
Frank, Carolin	Lydia Lichtiger	Earlham College	Grad Student Alumn		2015	Yosemite REU Program
Frank, Carolin	Meghana Shah	UC Merced	Grad Student Alumn		2012	
Frank, Carolin	Megs Seeley	University of Wiscor	Grad Student Alumn		2015	Yosemite REU Program
Frank, Carolin	Michael Urner	UC Merced	Grad Student Alumn		2010	
Frank, Carolin	Michele Conrad	UC Merced	Grad Student Alumn		2015	
Frank, Carolin	Mohammad Quasim	UC Merced	Grad Student Alumn	2013-2014		
Frank, Carolin	Olayinka Owoborode	UC Merced	Grad Student Alumn	2009-2010		
Frank, Carolin	Robert Castro	UC Merced	Grad Student Alumn		2011	
Frank, Carolin	Salah Dajani	UC Merced	Grad Student Alumn	2009-2010		
Frank, Carolin	Sara Bronell	University of Uppsal	Grad Student Alumn		2011	
Frank, Carolin	Weizhou Zhao	University of Uppsal	Grad Student Alumn	2011-2012		M.S. Thesis Poject
Frank, Carolin	Dana Carper	UC Merced	PhD			
Frank, Carolin	James Kupihea	UC Merced	PhD			
Frank, Carolin	Jorge Montiel	UC Merced	PhD			
Frank, Carolin	Paola Saldierna	UC Merced	PhD			
Dawson, Michael	Liza Gomez Daglio	UC Merced	PhD student			
Dawson, Michael	Holly Swift	UC Merced	PhD			
Dawson, Michael	Lauren Schiebelhut	UC Merced	PhD student			
Dawson, Michael	Sarah Abboud	UC Merced	PhD student			
Dawson, Michael	Mariana Rocha de Souza	UC Merced	PhD student			
Dawson, Michael	Judith Bayardo-Guzman	UC Merced	Undergrad			
Dawson, Michael	Kameron Jones	UC Merced	Undergrad			
Edwards, Dan	Kinsey Brock	UC Merced	PhD student			
Diaz, Gerardo	Andres Munoz	UC Merced	PhD student			
Diaz, Gerardo	Vivian Duong	UC Merced	M.S. program			
Diaz, Gerardo	Viacheslav Plotnikov	UC Merced	PhD student			
Diaz, Gerardo	Sergio Pineda	UC Merced	PhD			
Diaz, Gerardo	Neeraj Sharma	UC Merced	PhD			
Diaz, Gerardo	Huimin Li	UC Merced	Undergrad			
Diaz, Gerardo	Vaughn Emmerson	UC Merced	Undergrad			
Diaz, Gerardo	Robert Smith	UC Merced	Undergrad			
Diaz, Gerardo	David Unruh	UC Merced	Undergrad			
Diaz, Gerardo	Josue Lopez	UC Merced	Undergrad			
Diaz, Gerardo	Steven Fleming	UC Merced	Undergrad			
Diaz, Gerardo	Hugo Sanchez	UC Merced	Undergrad			
Diaz, Gerardo	Sheena Truong	UC Merced	Undergrad			
Diaz, Gerardo	Israr Hussain	UC Merced	Undergrad			
Diaz, Gerardo	Steven Telles	UCSC	Undergrad			
Diaz, Gerardo	Daniel Linarez	UC Merced	Undergrad			
Diaz, Gerardo	Azucena Robles	UC Merced	Undergrad			
Diaz, Gerardo	Adam Martin	UC Merced	Undergrad			
Diaz, Gerardo	Keith Saechao	UC Merced	Undergrad			
Diaz, Gerardo	Christan Castillo	UC Merced	Undergrad			
Matlock, Teenie	Bodo Winter	UC Merced	Phd candidate			
Matlock, Teenie	Till Bergman	UC Merced	Phd candidate			
Matlock, Teenie	Patricia Lichtenstein	UC Merced	PhD student			
Matlock, Teenie	Justin Matthews	UC Merced	PhD			
Moran, Emily	Mengjun Shu	UC Merced	Grad Student			
Moran, Emily	Jeffrey Lauder	UC Merced	Grad Student			
Moran, Emily	Presley Ramirez	UC Merced	Undergrad			

Moran, Emily	Kaitlin Delucchi	UC Merced	Undergrad	
Moran, Emily	Coral Quirino	UC Merced	Undergrad	
Moran, Emily	Anna Calderon	UC Merced	Undergrad	
Ghezzehei, Teamrat	Nate Bogie	UC Merced	Phd candidate	
Ghezzehei, Teamrat	Samuel Araya	UC Merced	PhD student	
Ghezzehei, Teamrat	Mathew Jian	UC Merced	PhD student	
Ghezzehei, Teamrat	Ben Lash	UC Merced	PhD student	
Ghezzehei, Teamrat	Vivian Lopez	UC Merced	M.S.	
Ghezzehei, Teamrat	Chelsea Arnold	UC Merced	PhD	
Ghezzehei, Teamrat	Ammar Albalasmeh	UC Merced	PhD	
Guo, Quinghua	Yanjun Su	UC Merced	Grad Student	
Guo, Quinghua	Jacob Flanagan	UC Merced	Grad Student	
Guo, Quinghua	Jingjing Zhu	UC Merced	Grad Student	
Guo, Quinghua	Otto Alvarez	UC Merced	Grad Student	
Guo, Quinghua	Paul Doherty	UC Merced	Grad Student	
Guo, Quinghua	Miguel Fernandez	UC Merced	Grad Student	
Guo, Quinghua	Jinqiang He	UC Merced	Grad Student	
Guo, Quinghua	Donghai Li	UC Merced	Grad Student	
Guo, Quinghua	Wenkai Li	UC Merced	Grad Student	
Guo, Quinghua	Gary Phelps	UC Merced	Grad Student	
Guo, Quinghua	Jinxia Zhu	UC Merced	Grad Student	
Guo, Quinghua	Nic Raboy		Undergrad	
Guo, Quinghua	Andew Zumkehr		Undergrad	
Harmon, Tom	Kumarswamy Sivakumaran	UC Merced	PhD	
Harmon, Tom	Sandra Villamizar	UC Merced	PhD	
Harmon, Tom	Steven Jepsen	UC Merced	PhD	
Hull, Kathleen	Shannon Acevedo	UC Merced	MA	
Hull, Kathleen	Christine Clarkson	UC Merced	MA	
Hull, Kathleen	Pao;a Di Giuseppantonio	UC Merced	PhD	
Hull, Kathleen	Holly Beitch	UC Merced	Undergrad	
Hull, Kathleen	Alexander Reinhold	UC Merced	Undergrad	
Kueppers, Lara	Kaitlin Lubetkin	UC Merced	PhD	
Kueppers, Lara	Andrew Moyes	UC Merced	PhD	
Kueppers, Lara	Greg Vose	UC Merced	M.S.	
Kueppers, Lara	Alex Lau	UC Merced	Undergrad	
Kueppers, Lara	Alan Hong	UC Merced	Undergrad	
Kueppers, Lara	Ana Becerri	UC Merced	Undergrad	
Kueppers, Lara	Marc Wasserma	UC Merced	Undergrad	
Kueppers, Lara	Ruth Xochihu	UC Merced	Undergrad	
Kueppers, Lara	Alyssa Carrell	UC Merced	Undergrad	
Leppert, Valerie	Kevin Mercurio	UC Merced	M.S.	2014
Leppert, Valerie	Aaron Cowles	UC Merced	PhD	
Leppert, Valerie	Gayatri Premshekharan	UC Merced	PhD	2012
Leppert, Valerie	Kennedy Nguyen	UC Merced	PhD	
Sexton, Jason	Erin Dickman	UC Merced	MS Candidate	
Sexton, Jason	Daniel Toews	UC Merced	MS Candidate	
Sexton, Jason	Jorge A. Montiel	UC Merced	Phd candidate	
Sexton, Jason	Jenna Heckel	UC Merced	Undergrad	
Sexton, Jason	Yazmin Lommel	UC Merced	Undergrad	
Sexton, Jason	Amanda Tse	UC Merced	Undergrad	
Sexton, Jason	Angelo Aragon	UC Merced	Undergrad	
Sexton, Jason	Alfredo Enriquez	UC Merced	Undergrad	
Sexton, Jason	Tyler Rackelmann	UC Merced	Undergrad	
Sexton, Jason	William Higson	UC Merced	Undergrad	

SNRI dollar value of transactions of State and Grant funds by Fiscal Year

Description and year	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	5 year total
Salaries and Benefits	468,118.15	225864	218966.6	85783.89	320571.1	1319304.13
Supplies and Expenses	547,512.90	55688.6	53606.94	377515.4	190178.4	1873690.01
Annual Total	180154.98	281553	437933.2	463299.3	510749.5	3192994.14

Note: the following pages are a listing of all expenses by budget category

Expenditure Sub-Object Summary
As of June 30, 2010

Ncpqml lcj _lb Qsnnjgcq DW /.-//

Account/CC: 449001/2A RESEARCH-SNRI-OPERATIONS
Fund : 19900 GENERAL FUNDS

Sub-Object	Description	Appropriation ( )=DEBIT	Expenditure ( )=CREDIT	Encumbrance	Ledger Bal ( )=OVERDRAFT	Memo-Lien	Oper Bal ( )=OVERDRAFT
00-0000	SALARIES-ACADEMIC-UNDESIGNATED E	115462.56					
00-1050	S&W-ACADEMIC ADMINISTRATIVE		33156.18				
00-1080	S&W-OTHER ACADEMIC		82306.38				
00 **		**115462.56**	**115462.56**	**0.00**	**0.00**	**0.00**	**0.00**
01-0000	SALARIES-STAFF-UNDESIGNATED BALA	51577.85					
01-1110	S&W-MGMT/CAREER STAFF		51577.85				
01 **		**51577.85**	**51577.85**	**0.00**	**0.00**	**0.00**	**0.00**
02-0000	GENERAL ASSISTANCE-UNDESIGNATEI	6267.91					
02-1080	S&W-OTHER ACADEMIC		102.54				
02-1115	O/TIME&O/SEA-MGMT/CAREER STAFF		25.86				
02-1130	S&W-CASUAL STAFF		6235.64				
02-1940	ACCRUED S & W COSTS		(96.13)				
02 **		**6267.91**	**6267.91**	**0.00**	**0.00**	**0.00**	**0.00**
03-0000	SUPPLIES & EXPENSE-UNDESIGNATED	49777.17					
03-2000	TRAVEL-IN-STATE AND DOMESTIC		960.26				
03-2020	PARKING		24.00				
03-2025	VEHICLE RENTAL-TRAVEL		62.11				
03-3003	FREIGHT AND SHIPPING-OUTGOING		193.53	46.21			
03-3105	MAINT/SVC AGREEMENT-COMPUTER SOFTWARE		200.00				
03-3130	MAINT/REPAIRS-BUILDINGS		1550.63				
03-3150	REPAIRS-OFFICE EQUIPMENT		39.00				
03-3160	REPAIRS-OTHER EQUIP		33.66				
03-3195	MISCELLANEOUS FACILITIES SERVICES		691.98				
03-3285	CUSTODIAL SERVICES		128.82				
03-3310	FOOD & BEVERAGE, BUSINESS CONFER & MTGS		749.55				
03-3380	INSURANCE		741.71				
03-3425	MEMBERSHIPS, BUSINESS AND PROFESSIONAL		1000.00				
03-3465	PARKING SERVICES		418.00				
03-3475	REFUSE DISPOSAL		641.25				
03-4001	TELEPHONE TOLLS		6966.34				
03-4003	TELEPHONE-OTHER		71.12	4.93			
03-4070	OUTGOING MAIL CHARGES		69.89				
03-4355	CHEMICALS AND COMPOUNDS INCL. ORGANIC		45.93				
03-4370	CLOTHING & UNIFORMS		5.00				
03-4380	COMPUTING SUPPLIES OR HARDWARE (<$200)		23.39				
03-4410	CUSTODIAL/CLEANING SUPPLIES		13.14				
03-4460	ELECT. SUPPLIES OR COMPONENTS		9.36				
03-4525	FURNITURE & FIXTURES (NON-INVENTORIAL)						
03-4585	KITCHEN SUPPLIES		97.71				
03-4630	LAB/SHOP INSTRUMENTS AND SUPPLIES		255.25				
03-4700	OFFICE SUPPLIES		2158.62				
03-4706	PACKAGING/CONTAINERS/ADHESIVES		11.96				
03-5210	UTILITIES-ELECTRICITY		9929.79	2912.95			
03-5220	UTILITIES-WATER & SEWER		1241.30				
03-5260	UTILITIES-PROPANE/BUTANE		2967.42				
03-5800	SPACE RENTAL/LEASE OFF-CAMPUS		4236.55	385.25			
03-5925	LEASE/RENTAL - OTHER EQUIPMENT		1372.74				
03-6010	PRINTING OF OFFICE SUPPLIES		74.30				
03-6020	ART/PHOTO SERVICES		143.93				
03-6030	COPYING SERVICES		174.38				
03-6045	AV/MEDIA SERVICES		7.57				
03-6600	COMPUTER SOFTWARE (ACQUISITION) <$5000		973.31				
03-7501	STUDENT AWARD - PAYMENT		8250.00			4500.00	
03-9100	THEFT SENS EQUIP $200-4999-COMP HARDWARE		594.72				
03-9103	THEFT SENS EQUIP $1500-4999-COMP HARDWAR		2648.95				
03 **		**49777.17**	**49777.17**	**3349.34**	**(3349.34)**	**4500.00**	**(7849.34)**
05-0000	SPECIAL ITEMS-UNDESIGNATED BALAN	231.20					
05-2000	TRAVEL-IN-STATE AND DOMESTIC		231.20				
05 **		**231.20**	**231.20**	**0.00**	**0.00**	**0.00**	**0.00**
06-0000	EMPLOYEE BENEFITS-UNDESIGNATED I	43357.58					
06-8940	ACCRUED BENEFITS COSTS		(1.97)				
06-8291	BENEFITS FOR ACADEMICS		24420.01				
06-8292	BENEFITS FOR STAFF CAREER		18849.55				
06-8293	BENEFITS FOR STAFF CASUAL		89.99				
06 **		**43357.58**	**43357.58**	**0.00**	**0.00**	**0.00**	**0.00**
07-0000	SPECIAL ITEMS-UNDESIGNATED BALAN	51878.02					
07-3125	MAINT/SVC AGREEMENT-OTHER EQUIP		29530.62	12846.62			
07-3310	FOOD & BEVERAGE, BUSINESS CONFER & MTGS		356.58				
07-3465	PARKING SERVICES		64.00				
07-3530	TEMPORARY PERSONNEL SERVICES		83.46				
07-4001	TELEPHONE TOLLS		542.19				
07-4355	CHEMICALS AND COMPOUNDS INCL. ORGANIC		548.90				
07-4370	CLOTHING & UNIFORMS		18.94				
07-4525	FURNITURE & FIXTURES (NON-INVENTORIAL)		74.82				
07-4535	GASES-COMPRESSED		1829.76	199.66			
07-4630	LAB/SHOP INSTRUMENTS AND SUPPLIES		17488.86	36.95			
07-4680	MEDICAL SUPPLIES		7.27				
07-4700	OFFICE SUPPLIES		273.82				
07-4850	SECURITY/SAFETY MATERIALS & SUPPLIES		318.26				
07-5925	LEASE/RENTAL - OTHER EQUIPMENT		7.36				
07-6605	COMP SOFTWARE LICENSE/RENTAL FEES		100.00				
07-9100	THEFT SENS EQUIP $200-4999-COMP HARDWARE		633.18				
07 **		**51878.02**	**51878.02**	**13083.23**	**(13083.23)**	**0.00**	**(13083.23)**
08-0000	UNALLOCATED AMTS-UNDESIGNATED E	27518.75					
08-3003	FREIGHT AND SHIPPING-OUTGOING		5.96				
08-3004	MOVING SERVICE		2369.55				
08-3125	MAINT/SVC AGREEMENT-OTHER EQUIP		1650.00				
08-3130	MAINT/REPAIRS-BUILDINGS		64.58				
08-3175	ALTS AND RENOVS, NON-CAPITALIZED		2092.00				
08-3310	FOOD & BEVERAGE, BUSINESS CONFER & MTGS		185.26				
08-3465	PARKING SERVICES		3713.44				
08-4001	TELEPHONE TOLLS		2256.19				
08-4525	FURNITURE & FIXTURES (NON-INVENTORIAL)		4844.00	211.09			
08-4585	KITCHEN SUPPLIES		1795.41				
08-4630	LAB/SHOP INSTRUMENTS AND SUPPLIES		3094.06				
08-4655	LINEN AND BEDDING						
08-4700	OFFICE SUPPLIES		22.10				
08-5210	UTILITIES-ELECTRICITY		30.86				
08-5260	UTILITIES-PROPANE/BUTANE		1309.81				
08-9102	THEFT SENS EQUIP $200-$4999-OFFICE EQUIP		3598.52				
08-9104	THEFT SENS EQUIP $200-$4999-OTHER EQUIP		487.01				
08 **		**27518.75**	**27518.75**	**211.09**	**(211.09)**	**0.00**	**(211.09)**
Total		**346071.04**	**346071.04**	**16643.66**	**(16643.66)**	**4500.00**	**(21143.66)**

Expenditure Sub-Object Summary
As of June 30, 2011

Personnel and Supplies FY 11/12

Account/CC: 449001/2A RESEARCH-SNRI-OPERATIONS
Fund : 19900 GENERAL FUNDS

Sub-Object	Description	Appropriation ( )=DEBIT	Expenditure ( )=CREDIT	Encumbrance	Ledger Bal ( )=OVERDRAFT	Memo-Lien	Oper Bal ( )=OVERDRAFT
00-0000	SALARIES-ACADEMIC-UNDESIGNATED E	96192.24					
00-1050	S&W-ACADEMIC ADMINISTRATIVE		35306.82				
00-1060	S&W-PROFESSIONAL RESEARCH		1691.75				
00-1080	S&W-OTHER ACADEMIC		59193.67				
00 **		**96192.24**	**96192.24**	**0.00**	**0.00**	**0.00**	**0.00**
01-0000	SALARIES-STAFF-UNDESIGNATED BALA	79396.07					
01-1110	S&W-MGMT/CAREER STAFF		80052.32				
01-1181	IAP AWARD FUNDING-CAREER		(656.25)				
01 **		**79396.07**	**79396.07**	**0.00**	**0.00**	**0.00**	**0.00**
02-0000	GENERAL ASSISTANCE-UNDESIGNATEI	4566.72					
02-1115	O/TIME&O/SEA-MGMT/CAREER STAFF		51.72				
02-1130	S&W-CASUAL STAFF		4500.00				
02-1135	O/TIME&O/SEA-CASUAL STAFF		15.00				
02 **		**4566.72**	**4566.72**	**0.00**	**0.00**	**0.00**	**0.00**
03-0000	SUPPLIES & EXPENSE-UNDESIGNATED	12185.73					
03-2000	TRAVEL-IN-STATE AND DOMESTIC		1317.66				
03-2020	PARKING		55.13				
03-2025	VEHICLE RENTAL-TRAVEL		364.56				
03-2100	TRAVEL-CONFERENCES FEES		65.00				
03-3002	FREIGHT AND SHIPPING-INCOMING			76.00			
03-3003	FREIGHT AND SHIPPING-OUTGOING		147.44				
03-3212	ADVERTISING-MARKETING/PROMOTION			94.72			
03-3214	PROMOTIONAL MATERIALS & SERVICES			1393.72			
03-3310	FOOD & BEVERAGE, BUSINESS CONFER & MTGS		838.21	0.02			
03-3380	INSURANCE		895.46				
03-3425	MEMBERSHIPS, BUSINESS AND PROFESSIONAL		1000.00				
03-3455	CONSULTANTS/PROFESSIONAL SVCS-NON UNIV		125.00				
03-3465	PARKING SERVICES		107.00				
03-4001	TELEPHONE TOLLS		882.95				
03-4003	TELEPHONE-OTHER		40.87				
03-4070	OUTGOING MAIL CHARGES		21.23				
03-4380	COMPUTING SUPPLIES OR HARDWARE (<$200)		1219.03				
03-4460	ELECT. SUPPLIES OR COMPONENTS		44.44				
03-4700	OFFICE SUPPLIES		1174.21				
03-5210	UTILITIES-ELECTRICITY			19.21			
03-5810	FACILITY RENTAL-SHORT TERM		45.00				
03-5925	LEASE/RENTAL - OTHER EQUIPMENT		1489.10				
03-6000	PRINTING OF PUBLICATIONS		94.27				
03-6010	PRINTING OF OFFICE SUPPLIES		32.38	2068.66			
03-6030	COPYING SERVICES		748.15				
03-6605	COMP SOFTWARE LICENSE/RENTAL FEES		250.00				
03-9102	THEFT SENS EQUIP $200-$4999-OFFICE EQUIP		1228.64				
03 **		**12185.73**	**12185.73**	**3652.33**	**(3652.33)**	**0.00**	**(3652.33)**
06-0000	EMPLOYEE BENEFITS-UNDESIGNATED I	45709.39					
06-8291	BENEFITS FOR ACADEMICS		19492.04				
06-8292	BENEFITS FOR STAFF CAREER		26193.34				
06-8293	BENEFITS FOR STAFF CASUAL		24.01				
06 **		**45709.39**	**45709.39**	**0.00**	**(0.00)**	**0.00**	**(0.00)**
07-0000	SPECIAL ITEMS-UNDESIGNATED BALAN	32194.78					
07-3003	FREIGHT AND SHIPPING-OUTGOING		41.44				
07-3125	MAINT/SVC AGREEMENT-OTHER EQUIP		21618.72				
07-3160	REPAIRS-OTHER EQUIP		3043.22			129.00	
07-3380	INSURANCE		21.58				
07-3465	PARKING SERVICES		64.00				
07-4001	TELEPHONE TOLLS		1449.18				
07-4535	GASES-COMPRESSED		446.96	231.28			
07-4585	KITCHEN SUPPLIES						
07-4630	LAB/SHOP INSTRUMENTS AND SUPPLIES		3131.08	240.32			
07-4635	LAB/SPECIALIZED EQUIPMENT < $200		1009.24				
07-9104	THEFT SENS EQUIP $200-$4999-OTHER EQUIP		1369.36				
07 **		**32194.78**	**32194.78**	**471.60**	**(471.60)**	**129.00**	**(600.60)**
08-0000	UNALLOCATED AMTS-UNDESIGNATED E	11308.13					
08-2000	TRAVEL-IN-STATE AND DOMESTIC		797.63				
08-2020	PARKING		24.00				
08-2040	CONFERENCE REG FEES/IN-STATE TRAVEL			1000.00			
08-3160	REPAIRS-OTHER EQUIP		1231.04				
08-3195	MISCELLANEOUS FACILITIES SERVICES		55.63				
08-3455	CONSULTANTS/PROFESSIONAL SVCS-NON UNIV		350.00				
08-3540	UTILITIES SERVICES		2676.09	1413.81			
08-4001	TELEPHONE TOLLS		345.36				
08-4380	COMPUTING SUPPLIES OR HARDWARE (<$200)			52.41			
08-4460	ELECT. SUPPLIES OR COMPONENTS		14.16				
08-4525	FURNITURE & FIXTURES (NON-INVENTORIAL)		726.46				
08-4630	LAB/SHOP INSTRUMENTS AND SUPPLIES		271.04				
08-4640	LAMPS, BULBS, AND LIGHTING FIXTURES		14.16				
08-5210	UTILITIES-ELECTRICITY		64.01				
08-5260	UTILITIES-PROPANE/BUTANE		90.00				
08-5800	SPACE RENTAL/LEASE OFF-CAMPUS		4648.55	358.26			
08 **		**11308.13**	**11308.13**	**2824.48**	**(2824.48)**	**0.00**	**(2824.48)**
Total		**281553.06**	**281553.06**	**6948.41**	**(6948.41)**	**129.00**	**(7077.41)**

Personnel and Supplies FY 12/13

Expenditure Sub-Object Summary
As of June 30, 2012

Account/CC: 449001/2A RESEARCH-SNRI-OPERATIONS
Fund : 19900 GENERAL FUNDS

Sub-Object	Description	Appropriation ( )=DEBIT	Expenditure ( )=CREDIT	Encumbrance	Ledger Bal ( )=OVERDRAFT	Memo-Lien	Oper Bal ( )=OVERDRAFT
00-0000	SALARIES-ACADEMIC-UNDESIGNATED E	85766.22					
00-1050	S&W-ACADEMIC ADMINISTRATIVE		35844.48				
00-1080	S&W-OTHER ACADEMIC		49921.74				
00		**85766.22**	**85766.22**	**0.00**	**0.00**	**0.00**	**0.00**
01-0000	SALARIES-STAFF-UNDESIGNATED BALA	32017.54					
01-1110	S&W-MGMT/CAREER STAFF		32017.54				
01		**32017.54**	**32017.54**	**0.00**	**0.00**	**0.00**	**0.00**
02-0000	GENERAL ASSISTANCE-UNDESIGNATEI	51346.44					
02-1120	S&W-CAREER STAFF SUB 2		42642.46				
02-1130	S&W-CASUAL STAFF		8292.38				
02-1940	ACCRUED S & W COSTS		411.60				
02		**51346.44**	**51346.44**	**0.00**	**0.00**	**0.00**	**0.00**
03-0000	SUPPLIES & EXPENSE-UNDESIGNATED	26544.34					
03-2000	TRAVEL-IN-STATE AND DOMESTIC		129.00				
03-2025	VEHICLE RENTAL-TRAVEL		188.09				
03-3002	FREIGHT AND SHIPPING-INCOMING		8.46				
03-3003	FREIGHT AND SHIPPING-OUTGOING		201.71	6.50			
03-3175	ALTS AND RENOVS, NON-CAPITALIZED		2256.00				
03-3195	MISCELLANEOUS FACILITIES SERVICES		208.58				
03-3212	ADVERTISING-MARKETING/PROMOTION		94.72				
03-3214	PROMOTIONAL MATERIALS & SERVICES		2637.35	69.83			
03-3310	FOOD & BEVERAGE, BUSINESS CONFER & MTGS		1928.28	0.04			
03-3380	INSURANCE		1130.23				
03-3425	MEMBERSHIPS, BUSINESS AND PROFESSIONAL		1200.00				
03-3464	PARKING SERVICES (RECHARGE)		40.00				
03-3465	PARKING SERVICES		40.00				
03-4001	TELEPHONE TOLLS		1292.83				
03-4003	TELEPHONE-OTHER		291.42				
03-4070	OUTGOING MAIL CHARGES		10.29				
03-4318	AUDIO SUPPLIES		160.03				
03-4380	COMPUTING SUPPLIES OR HARDWARE (<$200)		212.02				
03-4460	ELECT. SUPPLIES OR COMPONENTS		11.87				
03-4585	KITCHEN SUPPLIES		24.77				
03-4630	LAB/SHOP INSTRUMENTS AND SUPPLIES		976.68				
03-4700	OFFICE SUPPLIES		2062.73	3.76			
03-4706	PACKAGING/CONTAINERS/ADHESIVES		7.81				
03-5210	UTILITIES-ELECTRICITY		153.27	19.21			
03-5810	FACILITY RENTAL-SHORT TERM						
03-5925	LEASE/RENTAL - OTHER EQUIPMENT		1070.92				
03-6010	PRINTING OF OFFICE SUPPLIES		3750.01				
03-6030	COPYING SERVICES		338.49				
03-6300	SUBSCRIPTIONS		106.18			119.88	
03-9100	THEFT SENS EQUIP $200-4999-COMP HARDWARE		5131.56				
03-9102	THEFT SENS EQUIP $200-$4999-OFFICE EQUIP		661.82				
03		**26544.34**	**26325.12**	**99.34**	**119.88**	**119.88**	**(0.00)**
06-0000	EMPLOYEE BENEFITS-UNDESIGNATED I	49836.39					
06-8542	CORE MEDICAL-STAFF CAREER		47.46				
06-8940	ACCRUED BENEFITS COSTS		1.93				
06-8291	BENEFITS FOR ACADEMICS		24531.60				
06-8292	BENEFITS FOR STAFF CAREER		25176.74				
06-8293	BENEFITS FOR STAFF CASUAL		78.66				
06		**49836.39**	**49836.39**	**0.00**	**0.00**	**0.00**	**0.00**
07-0000	SPECIAL ITEMS-UNDESIGNATED BALAN	13960.87					
07-2000	TRAVEL-IN-STATE AND DOMESTIC		139.86				
07-3125	MAINT/SVC AGREEMENT-OTHER EQUIP		7692.00				
07-3160	REPAIRS-OTHER EQUIP		760.00	820.00		129.00	
07-3195	MISCELLANEOUS FACILITIES SERVICES		145.31				
07-3464	PARKING SERVICES (RECHARGE)		8.00				
07-3465	PARKING SERVICES		32.00				
07-4001	TELEPHONE TOLLS		879.56				
07-4318	AUDIO SUPPLIES		203.65				
07-4380	COMPUTING SUPPLIES OR HARDWARE (<$200)		101.64				
07-4630	LAB/SHOP INSTRUMENTS AND SUPPLIES		990.85	37.95			
07-4850	SECURITY/SAFETY MATERIALS & SUPPLIES		27.42				
07-5925	LEASE/RENTAL - OTHER EQUIPMENT		12.00				
07-9100	THEFT SENS EQUIP $200-4999-COMP HARDWARE		500.41				
07-9104	THEFT SENS EQUIP $200-$4999-OTHER EQUIP		1481.22				
07		**13960.87**	**12973.92**	**857.95**	**129.00**	**129.00**	**0.00**
08-0000	UNALLOCATED AMTS-UNDESIGNATED E	13101.73					
08-2000	TRAVEL-IN-STATE AND DOMESTIC		610.45				
08-2020	PARKING		50.00				
08-2040	CONFERENCE REG FEES/IN-STATE TRAVEL			1000.00			
08-3003	FREIGHT AND SHIPPING-OUTGOING		47.34				
08-3130	MAINT/REPAIRS-BUILDINGS		152.37				
08-3160	REPAIRS-OTHER EQUIP		265.28				
08-3310	FOOD & BEVERAGE, BUSINESS CONFER & MTGS		34.06				
08-3540	UTILITIES SERVICES		1686.84	173.22			
08-3545	VISA APPLICATION-OUTSIDE LEGAL SRVS FEE		460.00				
08-4001	TELEPHONE TOLLS		100.81				
08-4380	COMPUTING SUPPLIES OR HARDWARE (<$200)			52.41			
08-4630	LAB/SHOP INSTRUMENTS AND SUPPLIES		3091.44				
08-5800	SPACE RENTAL/LEASE OFF-CAMPUS		5357.56	0.70			
08-6010	PRINTING OF OFFICE SUPPLIES		19.25				
08		**13101.73**	**11875.40**	**1226.33**	**(0.00)**	**0.00**	**(0.00)**
Total		**272573.53**	**270141.03**	**2183.62**	**248.88**	**248.88**	**0.00**

Personnel and Supplies FY 13/14

Expenditure Sub-Object Summary
As of June 30, 2013

Account/CC: 449001/2A RESEARCH-SNRI-OPERATIONS
Fund : 19900 GENERAL FUNDS

Sub-Object	Description	Appropriation ( )=DEBIT	Expenditure ( )=CREDIT	Encumbrance	Ledger Bal ( )=OVERDRAFT	Memo-Lien	Oper Bal ( )=OVERDRAFT
00-0000	SALARIES-ACADEMIC-UNDESIGNATED E	89809.91					
00-1050	S&W-ACADEMIC ADMINISTRATIVE		35844.48				
00-1070	S&W-APPRENTICE RESEARCH		17235.00				
00-1080	S&W-OTHER ACADEMIC		13735.43				
00-1888	ACADEMIC SALARIES-DEFAULT		22995.00				
00 **		**89809.91**	**89809.91**	**0.00**	**0.00**	**0.00**	**0.00**
01-0000	SALARIES-STAFF-UNDESIGNATED BALA	76873.15					
01-1110	S&W-MGMT/CAREER STAFF		76251.18				
01-1115	O/TIME & O/SEAS-MGMT/CAREER STAFF		(50.43)				
01-1940	ACCRUED S & W COSTS		672.40				
01 **		**76873.15**	**76873.15**	**0.00**	**0.00**	**0.00**	**0.00**
02-0000	GENERAL ASSISTANCE-UNDESIGNATEI	142271.89					
02-1115	O/TIME&O/SEA-MGMT/CAREER STAFF		100.86				
02-1120	S&W-CAREER STAFF SUB 2		119897.50				
02-1130	S&W-CASUAL STAFF		22685.13				
02-1132	TERMINAL VAC GROSS REDUCTION-CAREER						
02-1133	TERMINAL VAC GROSS REDUCTION-CASUAL						
02-1940	ACCRUED S & W COSTS		(411.60)				
02 **		**142271.89**	**142271.89**	**0.00**	**0.00**	**0.00**	**0.00**
03-0000	SUPPLIES & EXPENSE-UNDESIGNATED	26135.66					
03-2000	TRAVEL-IN-STATE AND DOMESTIC		113.00				
03-2040	CONFERENCE REG FEES/IN-STATE TRAVEL			1000.00			
03-2045	CONFERENCE REG FEES/OUT-OF-STATE TRAVEL		350.00				
03-3003	FREIGHT AND SHIPPING-OUTGOING		385.29	27.26			
03-3160	REPAIRS-OTHER EQUIP		500.00				
03-3214	PROMOTIONAL MATERIALS & SERVICES		917.54				
03-3265	COMPUTING NETWORK SERVICES		99.00				
03-3307	ENTERTAINMENT-NON FOOD & BEVERAGE		625.00				
03-3310	FOOD & BEVERAGE, BUSINESS CONFER & MTGS		12010.32	0.01			
03-3320	EVENT COORDINATION		195.00				
03-3380	INSURANCE		2040.16				
03-3425	MEMBERSHIPS, BUSINESS AND PROFESSIONAL		100.00				
03-3464	PARKING SERVICES (RECHARGE)		254.00				
03-4000	TELEPHONE EQUIPMENT		32.46				
03-4001	TELEPHONE TOLLS		1449.25				
03-4003	TELEPHONE-OTHER		307.57				
03-4070	OUTGOING MAIL CHARGES		8.29				
03-4380	COMPUTING SUPPLIES OR HARDWARE (<$200)		221.09				
03-4630	LAB/SHOP INSTRUMENTS AND SUPPLIES		(883.07)				
03-4700	OFFICE SUPPLIES		1284.58				
03-4701	OFFICE SUPPLIES-RECHARGED		5.00				
03-5210	UTILITIES-ELECTRICITY			19.21			
03-5925	LEASE/RENTAL - OTHER EQUIPMENT		419.72				
03-6010	PRINTING OF OFFICE SUPPLIES		2334.96	645.00			
03-6030	COPYING SERVICES		128.83				
03-6045	AV/MEDIA SERVICES			80.63			
03-6300	SUBSCRIPTIONS					119.88	
03-9100	THEFT SENS EQUIP $200-4999-COMP HARDWARE		1345.68				
03 **		**26135.66**	**24243.67**	**1772.11**	**119.88**	**119.88**	**(0.00)**
04-9114	INVENTORIAL EQUIPMENT-OTHER EQUIP						
04 **		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
05-0000	SPECIAL ITEMS-UNDESIGNATED BALAN	7776.14					
05-2000	TRAVEL-IN-STATE AND DOMESTIC		2102.93				
05-2015	TRAVEL - FOREIGN		3493.00				
05-2020	PARKING		139.00				
05-2040	CONFERENCE REG FEES/IN-STATE TRAVEL			795.00			
05-2100	TRAVEL-CONFERENCES FEES		50.00				
05-3310	FOOD & BEVERAGE, BUSINESS CONFER & MTGS		38.68				
05-4505	FOOD			48.00			
05-5925	LEASE/RENTAL - OTHER EQUIPMENT		1109.53				
05 **		**7776.14**	**6933.14**	**843.00**	**0.00**	**0.00**	**0.00**
06-0000	EMPLOYEE BENEFITS-UNDESIGNATED I	103912.47					
06-8563	CORE LIFE-STAFF CASUAL		3.76				
06-8710	DENTAL INSURANCE-PSBP		243.60				
06-8720	HEALTH INSURANCE-PSBP		5839.35				
06-8730	VISION INSURANCE-PSBP		42.90				
06-8741	DISABILITY INSURANCE-PSBP		44.10				
06-8751	LIFE INSURANCE-PSBP		15.75				
06-8761	BROKER FEES-PSBP		49.15				
06-8940	ACCRUED BENEFITS COSTS		137.80				
06-8291	BENEFITS FOR ACADEMICS		12383.50				
06-8292	BENEFITS FOR STAFF CAREER		77914.50				
06-8293	BENEFITS FOR STAFF CASUAL		7238.06				
06 **		**103912.47**	**103912.47**	**0.00**	**0.00**	**0.00**	**0.00**
07-0000	SPECIAL ITEMS-UNDESIGNATED BALAN	21874.92					
07-3160	REPAIRS-OTHER EQUIP					129.00	
07-3212	ADVERTISING-MARKETING/PROMOTION		3000.00				
07-3214	PROMOTIONAL MATERIALS & SERVICES		2286.53				
07-3310	FOOD & BEVERAGE, BUSINESS CONFER & MTGS		581.92				
07-3425	MEMBERSHIPS, BUSINESS AND PROFESSIONAL		1000.00				
07-3455	CONSULTANTS/PROFESSIONAL SVCS-NON UNIV		8452.00				
07-3464	PARKING SERVICES (RECHARGE)		88.00				
07-3540	UTILITIES SERVICES		1060.62				
07-4001	TELEPHONE TOLLS		545.90				
07-4535	GASES-COMPRESSED		155.01				
07-4630	LAB/SHOP INSTRUMENTS AND SUPPLIES						
07-5800	SPACE RENTAL/LEASE OFF-CAMPUS		4563.94				
07-5925	LEASE/RENTAL - OTHER EQUIPMENT		12.00				
07 **		**21874.92**	**21745.92**	**0.00**	**129.00**	**129.00**	**0.00**
08-0000	UNALLOCATED AMTS-UNDESIGNATED E	(673.56)					
08-2000	TRAVEL-IN-STATE AND DOMESTIC						
08-2040	CONFERENCE REG FEES/IN-STATE TRAVEL						
08-3307	ENTERTAINMENT-NON FOOD & BEVERAGE						
08-3540	UTILITIES SERVICES		96.59	235.11		1200.00	
08-3545	VISA APPLICATION-OUTSIDE LEGAL SRVS FEE		(460.00)				
08-4001	TELEPHONE TOLLS		14.71				
08-4380	COMPUTING SUPPLIES OR HARDWARE (<$200)						
08-4630	LAB/SHOP INSTRUMENTS AND SUPPLIES		(2142.17)				
08-5800	SPACE RENTAL/LEASE OFF-CAMPUS			382.20			
08 **		**(673.56)**	**(2490.87)**	**617.31**	**1200.00**	**1200.00**	**0.00**
Total		**467980.58**	**463299.28**	**3232.42**	**1448.88**	**1448.88**	**0.00**

Expenditure Sub-Object Summary
As of June 30, 2014

Personnel and Supplies FY 14/15

Account/CC: 449001/2A RESEARCH-SNRI-OPERATIONS
Fund : 19900 GENERAL FUNDS

Sub-Object	Description	Appropriation ( )=DEBIT	Expenditure ( )=CREDIT	Encumbrance	Ledger Bal ( )=OVERDRAFT	Memo-Lien	Oper Bal ( )=OVERDRAFT
00-0000	SALARIES-ACADEMIC-UNDESIGNATED E	383494.00					
00-1050	S&W-ACADEMIC ADMINISTRATIVE		54512.16				
00-1070	S&W-APPRENTICE RESEARCH		45878.77				
00-1080	S&W-OTHER ACADEMIC		30439.80				
00-1888	ACADEMIC SALARIES-DEFAULT		(10347.75)				
00 **		**383494.00**	**120482.98**	**0.00**	**263011.02**	**0.00**	**263011.02**
01-0000	SALARIES-STAFF-UNDESIGNATED BALA	195159.49					
01-1110	S&W-MGMT/CAREER STAFF		183940.52				
01-1940	ACCRUED S & W COSTS		199.76				
01 **		**195159.49**	**184140.28**	**0.00**	**11019.21**	**0.00**	**11019.21**
02-0000	GENERAL ASSISTANCE-UNDESIGNATEI	15947.82					
02-1130	S&W-CASUAL STAFF		11500.96				
02-1140	S&W-WORK-STUDY		3396.05				
02-1940	ACCRUED S & W COSTS		1050.81				
02 **		**15947.82**	**15947.82**	**0.00**	**0.00**	**0.00**	**0.00**
03-0000	SUPPLIES & EXPENSE-UNDESIGNATED	46642.48					
03-2000	TRAVEL-IN-STATE AND DOMESTIC		381.36				
03-2040	CONFERENCE REG FEES/IN-STATE TRAVEL						
03-3002	FREIGHT AND SHIPPING-INCOMING		58.92				
03-3003	FREIGHT AND SHIPPING-OUTGOING		421.89	12.70			
03-3195	MISCELLANEOUS FACILITIES SERVICES		124.68				
03-3210	ADVERTISING-RECRUITMENT/PROCUREMENT		187.50				
03-3214	PROMOTIONAL MATERIALS & SERVICES		3588.89	15.00			
03-3265	COMPUTING NETWORK SERVICES		99.00				
03-3308	ENTERTAINMENT-FOOD & BEVERAGE		300.00				
03-3310	FOOD & BEVERAGE, BUSINESS CONFER & MTGS		2422.06	0.01			
03-3345	GUEST LECTURERS		500.00				
03-3380	INSURANCE		2295.30				
03-3399	COSTS OF LEGAL PROCEEDINGS		2330.00				
03-3425	MEMBERSHIPS, BUSINESS AND PROFESSIONAL		175.00				
03-3464	PARKING SERVICES (RECHARGE)		138.00				
03-3545	VISA APPLICATION-OUTSIDE LEGAL SRVS FEE		1700.88				
03-4001	TELEPHONE TOLLS		2761.16				
03-4003	TELEPHONE-OTHER		191.10				
03-4070	OUTGOING MAIL CHARGES		9.22				
03-4380	COMPUTING SUPPLIES OR HARDWARE (<$200)		678.44				
03-4410	CUSTODIAL/CLEANING SUPPLIES		181.05				
03-4460	ELECT. SUPPLIES OR COMPONENTS		61.73				
03-4525	FURNITURE & FIXTURES (NON-INVENTORIAL)			2807.41			
03-4630	LAB/SHOP INSTRUMENTS AND SUPPLIES		73.71				
03-4640	LAMPS, BULBS, AND LIGHTING FIXTURES		267.36				
03-4700	OFFICE SUPPLIES		3603.41				
03-4701	OFFICE SUPPLIES-RECHARGED		176.80				
03-4706	PACKAGING/CONTAINERS/ADHESIVES		153.64				
03-4715	PAPER/PLASTIC SUPPLIES - NON-OFFICE		229.80				
03-4771	PROJECT SPECIFIC OFFICE TYPE SUPPLIES		827.70	1.07			
03-4850	SECURITY/SAFETY MATERIALS & SUPPLIES		32.07				
03-5210	UTILITIES-ELECTRICITY			19.21			
03-5800	SPACE RENTAL/LEASE OFF-CAMPUS		5252.88				
03-6010	PRINTING OF OFFICE SUPPLIES		2081.28	28.49			
03-6030	COPYING SERVICES		229.84				
03-6045	AV/MEDIA SERVICES		81.00				
03-6300	SUBSCRIPTIONS						
03-9100	THEFT SENS EQUIP $200-4999-COMP HARDWARE		7320.47				
03-9101	NON-INVENT EQUIP $200-4999-COPYING EQUIP		4822.45				
03 **		**46642.48**	**43758.59**	**2883.89**	**0.00**	**0.00**	**0.00**
04-9111	INVENTORIAL EQUIPMENT-COPYING EQUIPMENT						
04 **		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
05-0000	SPECIAL ITEMS-UNDESIGNATED BALAN	19987.23					
05-2000	TRAVEL-IN-STATE AND DOMESTIC		10982.26	250.23			
05-2015	TRAVEL - FOREIGN		3520.92				
05-2020	PARKING		263.00				
05-2025	VEHICLE RENTAL-TRAVEL		395.97				
05-2040	CONFERENCE REG FEES/IN-STATE TRAVEL		3152.00				
05-2045	CONFERENCE REG FEES/OUT-OF-STATE TRAVEL		350.00				
05-2100	TRAVEL-CONFERENCES FEES		382.04				
05-3310	FOOD & BEVERAGE, BUSINESS CONFER & MTGS			11.48			
05-4505	FOOD		48.00				
05-5925	LEASE/RENTAL - OTHER EQUIPMENT		631.33				
05 **		**19987.23**	**19725.52**	**261.71**	**(0.00)**	**0.00**	**(0.00)**
06-0000	EMPLOYEE BENEFITS-UNDESIGNATED I	110619.78					
06-8541	CORE MEDICAL-ACADEMIC		223.41				
06-8543	CORE MEDICAL-STAFF CASUAL		679.14				
06-8563	CORE LIFE-STAFF CASUAL		1.88				
06-8571	GRADUATE STUDENT HEALTH INS-ACADEMIC		277.10				
06-8591	OP GRAD STUDENT FEE REMISSION ACADEMIC		1855.02				
06-8641	GRAD STDNT PARTIAL FEE REMISSION 2-ACAD		160.70				
06-8710	DENTAL INSURANCE-PSBP		376.04				
06-8720	HEALTH INSURANCE-PSBP		10119.96				
06-8730	VISION INSURANCE-PSBP		102.68				
06-8741	DISABILITY INSURANCE-PSBP		111.72				
06-8751	LIFE INSURANCE-PSBP		37.80				
06-8761	BROKER FEES-PSBP		117.96				
06-8940	ACCRUED BENEFITS COSTS		99.82				
06-8291	BENEFITS FOR ACADEMICS		22427.34				
06-8292	BENEFITS FOR STAFF CAREER		73858.71				
06-8293	BENEFITS FOR STAFF CASUAL		170.50				
06 **		**110619.78**	**110619.78**	**0.00**	**0.00**	**0.00**	**0.00**
07-0000	SPECIAL ITEMS-UNDESIGNATED BALAN	169602.75					
07-2000	TRAVEL-IN-STATE AND DOMESTIC		14175.00				
07-3195	MISCELLANEOUS FACILITIES SERVICES		139.06				
07-3425	MEMBERSHIPS, BUSINESS AND PROFESSIONAL		1109.65	100.00			
07-3540	UTILITIES SERVICES		289.77				
07-4001	TELEPHONE TOLLS		103.86				
07-5925	LEASE/RENTAL - OTHER EQUIPMENT		257.20				
07 **		**169602.75**	**16074.54**	**100.00**	**153428.21**	**0.00**	**153428.21**
08-0000	UNALLOCATED AMTS-UNDESIGNATED E	1913.90					
08-3540	UTILITIES SERVICES			41.93			
08-5800	SPACE RENTAL/LEASE OFF-CAMPUS			382.20			
08 **		**1913.90**	**0.00**	**424.13**	**1489.77**	**0.00**	**1489.77**
Total		**943367.45**	**510749.51**	**3669.73**	**428948.21**	**0.00**	**428948.21**

Payroll Expense Distribution Report

Year: 2010

Title Code	Position Name	Paid Amount	FTE	Paid Out of SNRI Office	
0210	Vice Chancellor Assistant	$-	1.00	Motton, Deborah	
1099	Admin Stipend	$37,646.78	1.00	Bales, Roger	
3390	Project Scientist	$77,689.19	0.75	Eric, Berlow	
3392	Asso Project Scientist	$55,507.17	0.50	Zhao, Liying	
4919	Student Asst 4	$4,317.93	1.00	Zumkehr, Andrew	
7646	Admin Specialist	$47,378.57	1.00	Ventura, Cleotilde	Motton, Deborah
8214	Faculty Maintenance Supervisor	$54,624.38	1.00	Rumble, Timmy	
	Total	$277,164.02	0.89		

Year: 2011

Title Code	Position Name	Paid Amount	FTE	Paid Out of SNRI Office	
1099	Admin Stipend	$41,050.44	1.00	Bales, Roger	
3205	Academic Researcher	$76,688.95	1.00		
3215	Academic Assoc Researcher	$33,943.86	1.00		
3220	Asst Researcher	$49,910.59	1.00	Rice, Robert	
3225	Professional Research	$14,701.68	1.00		
3252	Post Doctoral Scholar	$168,403.83	1.00		
3266	Graduate Student Researcher	$57,364.58	1.00		
3276	Graduate Student - Partial Fee Rem	$42,964.95	1.00		
3390	Project Scientist	$51,754.01	0.75	Eric, Berlow	
3392	Asso Project Scientist	$74,896.05	0.50	Zhao, Liying	
3395	Asso Project Scientist	$4,079.91	1.00		
4919	Student Asst 4	$24,131.35	1.00	Zumkehr, Andrew	Lam, Lawrence
4920	Student Asst 3	$28,986.08	1.00		
4921	Student Asst 2	$567.91	1.00		
7277	Program Analyst 2	$88,385.99	1.00		
7646	Admin Specialist	$56,553.70	1.00	Valle-Arevalo, Alexis	Ventura, Cleotilde
8214	Faculty Maintenance Supervisor	$50,098.09	1.00	Rumble, Timmy	
9603	Lab Asst 2	$27,851.47	1.00		
9610	Staff Research Asso. 4	$50,490.93	1.00		
9611	Staff Research Asso. 3	$129,672.99	1.00		
9612	Staff Research Asso. 2	$68,576.08	1.00		
	Total	$1,141,073.44	0.96		

Year: 2012

Title Code	Position Name	Paid Amount	FTE	Paid Out of SNRI Office	
0389	Academic Prog Manager 2	$43,528.69	1.00	Hosley, David	
0451	Director Executive	$106,671.15	1.00	Hosley, David	
1099	Admin Stipend	$42,217.75	1.00	Bales, Roger	
1243	Asso Professor	$37,312.64	1.00		
3205	Academic Researcher	$132,050.27	1.00		
3215	Academic Assoc Researcher	$52,820.49	1.00		
3225	Professional Research	$31,959.72	1.00		
3252	Post Doctoral Scholar	$245,711.97	1.00		
3266	Graduate Student Researcher	$65,160.19	1.00		
3276	Graduate Student - Partial Fee Rem	$142,575.62	1.00		
3330	JR Specialist	$16,524.40	0.50		
3392	Asso Project Scientist	$117,443.19	1.00	Zhao, Liying	
3394	Asso Project Scientist	$64,758.19	1.00		
3395	Asso Project Scientist	$9,909.45	1.00		
4919	Student Asst 4	$20,826.18	1.00		
4920	Student Asst 3	$25,058.56	1.00		
4921	Student Asst 2	$15,882.54	1.00	Lin, Alexander	Weikel, Brian
4922	Student Asst 1	$1,123.47	1.00		
5193	Fac Management Specialist 1	$13,327.52	1.00		
6256	Research Data Analyst 2	$18,631.40	1.00		
7277	Program Analyst 2	$83,030.62	1.00		
7299	Applications Programmer 2	$4,346.75	1.00		
7371	Admin Asst 1	$6,833.58	1.00	Maul, Paulette	
7376	Admin Officer 2	$22,376.45	1.00	Ventura, Cleotilde	
7558	Bus Technical Support Analyst	$5,342.21	1.00		
7646	Admin Specialist	$37,169.03	1.00	Valle-Arevalo, Alexis	
7775	Buyer 1	$11,970.34	1.00	Valle-Arevalo, Alexis	
8214	Faculty Maintenance Supervisor	$42,023.81	1.00		
9603	Lab Asst 2	$22,304.16	1.00		
9605	Lab Asst 1	$25,172.90	1.00		
9610	Staff Research Asso. 4	$85,474.12	1.00		
9611	Staff Research Asso. 3	$164,919.39	1.00		
9612	Staff Research Asso. 2	$93,703.26	1.00		
9613	Staff Research Asso. 1	$21,754.72	1.00		
	Total	$1,829,914.73	0.99		

Year: 2013

Title Code	Position Name	Paid Amount	FTE	Paid Out of SNRI Office	
0389	Academic Prog Manager 2	$84,091.81	1.00	Hosley, David	
0451	Director Executive	$1.63	1.00	Hosley, David	
0843	Academic Coordinator	$28,653.33	1.00	Shackelton, Stephen	
1099	Admin Stipend	$28,879.64	1.00	Bales, Roger	Conklin, Martha
1243	Asso Professor	$37,916.46	1.00		
1681	Lec PSOE	$28,309.00	1.00		
3205	Academic Researcher	$131,184.12	1.00		
3215	Academic Assoc Researcher	$79,735.52	1.00		
3220	Asst Researcher	$60,909.69	1.00		
3225	Professional Research	$43,467.93	1.00	Gann, Timothy	
3252	Post Doctoral Scholar	$269,008.51	1.00		
3266	Graduate Student Researcher	$54,018.52	1.00		
3276	Graduate Student - Partial Fee Rem	$172,959.24	1.00	Lucas, Ryan	
3320	Asst Specialist	$20,758.62	1.00		
3390	Project Scientist	$19,700.17	0.75	Shackelton, Stephen	
3391	Project Scientist	$96,011.54	1.00	Miller, Norman	
3392	Asso Project Scientist	$6,991.66	0.50	Zhao, Liying	
3394	Asso Project Scientist	-$46,130.62	1.00		
3395	Asso Project Scientist	$10,129.66	1.00		
4724	Blank Asst 1	$6,412.82	1.00	Champie, Stefanie	
4919	Student Asst 4	$785.22	1.00		
4920	Student Asst 3	$50,745.30	1.00		
4921	Student Asst 2	$13,562.23	1.00	Canales, Claudia	Woodbury, Patrick
4922	Student Asst 1	$6,267.98	1.00		
5193	Fac Management Specialist 1	-$12,086.53	1.00		
6206	Research Admin 3	$101,748.00	1.00	Perez, Mark	
7277	Program Analyst 2	$-	1.00		
7299	Applications Programmer 2	$40,801.89	1.00		
7371	Admin Asst 1	$16,334.21	1.00	Maul, Paulette	
7375	Admin. Supervisor 2	$59,487.54	1.00	Ventura, Cleotilde	
7376	Admin Officer 2	$28,434.19	1.00	Ventura, Cleotilde	
7377	Admin Officer 3	$37,023.86	1.00	Valle-Arevalo, Alexis	
7558	Bus Technical Support Analyst	$17,220.78	1.00		
7707	Financial Analyst 1	$8,989.28	1.00	Perez, Mark	
7775	Buyer 1	$26,218.39	1.00	Valle-Arevalo, Alexis	
8214	Faculty Maintenance Supervisor	-$15,453.30	1.00		
9602	Lab Asst 3	$4,739.35	1.00		

Year: 2013

Title Code	Position Name	Paid Amount	FTE	Paid Out of SNRI Office	
9603	Lab Asst 2	$32,016.35	1.00		
9605	Lab Asst 1	$41,278.15	1.00		
9610	Staff Research Asso. 4	$88,534.71	1.00		
9611	Staff Research Asso. 3	$136,503.73	1.00		
9612	Staff Research Asso. 2	$129,561.99	1.00		
9613	Staff Research Asso. 1	$59,803.56	1.00		
	Total	$2,005,526.13	0.98		

Year: 2014

Title Code	Position Name	Paid Amount	FTE	Paid Out of SNRI Office	
0843	Academic Coordinator	$27,724.20	1.00	Shackelton, Stephen	
1099	Admin Stipend	$32,006.77	1.00	Bales, Roger	Conklin, Martha
1681	Lec PSOE	$19,535.08	1.00		
1989	Prof Researcher Bus/Mgmt/Eng	$49,732.06	1.00	Safeeq, Mohammad	
3205	Academic Researcher	$182,664.39	1.00		
3215	Academic Assoc Researcher	$119,799.54	1.00		
3220	Asst Researcher	$81,504.91	1.00		
3225	Professional Research	$9,429.29	1.00		
3252	Post Doctoral Scholar	$364,654.66	1.00	Gann, Timothy	
3266	Graduate Student Researcher	$72,388.68	1.00		
3276	Graduate Student - Partial Fee Rem	$186,032.89	1.00		
3390	Project Scientist	$51,534.98	0.75	Shackelton, Stephen	
3391	Project Scientist	$63,568.87	1.00		
3392	Asso Project Scientist	$13,973.40	0.50		
3394	Asso Project Scientist	$4,213.76	1.00		
3395	Asso Project Scientist	$7,001.13	1.00		
4723	Blank Asst 2	$44,207.81	1.00	Galvan, Crystal	
4919	Student Asst 4	$24,576.53	1.00		
4920	Student Asst 3	$30,419.68	1.00	Jarret, Thomas	Woodbury, Patrick
4921	Student Asst 2	$14,496.01	1.00	Canales, Claudia	Woodbury, Patrick
4922	Student Asst 1	$4,202.28	1.00	Frise, Andre	
6206	Research Admin 3	$65,891.64	1.00	Perez, Mark	
6256	Research Data Analyst 2	$74,702.15	1.00		
7299	Applications Programmer 2	$33,985.23	1.00		
7375	Admin. Supervisor 2	$93,531.68	1.00	Ventura, Cleotilde	
7377	Admin Officer 3	$75,477.68	1.00	Valle-Arevalo, Alexis	
7558	Bus Technical Support Analyst	$17,249.00	1.00		
9602	Lab Asst 3	$33,749.46	1.00	Montoya, Alfonso	

Year: 2014

Title Code	Position Name	Paid Amount	FTE	Paid Out of SNRI Office	
9603	Lab Asst 2	$14,475.60	1.00		
9605	Lab Asst 1	$78,233.21	1.00	Gonzales, James	
9610	Staff Research Asso. 4	$38,294.32	1.00		
9611	Staff Research Asso. 3	$131,003.36	1.00		
9612	Staff Research Asso. 2	$106,739.57	1.00		
9613	Staff Research Asso. 1	$5,847.01	1.00		
	Total	$2,172,846.83	0.98		

Year: 2015

Title Code	Position Name	Paid Amount	FTE	Paid Out of SNRI Office	
0554	Exec Advisor 4	$60,339.98	1.00	Quintero, Armando	
1099	Admin Stipend	$25,322.57	1.00	Bales, Roger	
1681	Lec PSOE	$10,054.80	1.00		
1989	Prof Reseacher Bus/Mgmt/Eng	$75,186.93	1.00	Safeeq, Mohamad	
3205	Academic Researcher	$71,614.63	1.00		
3215	Academic Assoc Resercher	$48,395.99	1.00		
3220	Asst Reseacher	$1,764.56	1.00		
3225	Professional Research	$11,017.88	1.00		
3252	Post Doctoral Scholar	$129,041.37	1.00	Gann, Timothy	Rheinheimer, David
3266	Graduate Student Researcher	$58,365.82	1.00		
3276	Graduate Student - Partial Fee Rem	$115,937.39	1.00		
3391	Project Scientist	$59,082.38	1.00	Miller, Norman	
3392	Asso Project Scientist	$4,622.41	0.50		
3394	Asso Project Scientist	$45,787.39	1.00		
3395	Asso Project Scientist	$29,928.26	1.00		
4723	Blank Asst 2	$12,271.79	1.00	Galvan, Crystal	
4724	Blank Asst 1	$13,410.87	1.00	Perez, Brandon	Valero, Antonio
4920	Student Asst 3	$9,557.10	1.00	Martinez, Andrew	Woodbury, Patrick
4921	Student Asst 2	$5,699.41	1.00	Frise, Andre	
4922	Student Asst 1	$4,746.59	1.00	Frise, Andre	
6256	Research Data Analyst 2	$40,812.52	1.00		
7299	Applications Programmer 2	$17,323.50	1.00		
7375	Admin. Supervisor 2	$45,279.68	1.00	Ventura, Cleotilde	
7376	Admin Officer 2	$15,296.13	1.00	Galvan, Crystal	
7377	Admin Officer 3	$37,687.31	1.00	Valle-Arevalo, Alexis	
7558	Bus Technical Support Analyst	$8,798.16	1.00		
9602	Lab Asst 3	$2,904.27	1.00	Montoya, Alfonso	
9605	Lab Asst 1	$8,695.49	1.00	Gonzales, James	

Year: 2015

Title Code	Position Name	Paid Amount	FTE	Paid Out of SNRI Office	
9611	Staff Research Asso. 3	$124,252.57	1.00	Harrison, Brent	
9612	Staff Research Asso. 2	$40,745.59	1.00		
	Total	$1,133,943.34	0.98		

Totals for 2010-2015

Title Code	Position Name	Paid Amount	FTE	Paid Out of SNRI Office
0210	Vice Chancellor Assistant	$-	1.00	see previous
0389	Academic Prog Manager 2	$127,620.50	1.00	see previous
0451	Director Executive	$106,672.78	1.00	see previous
0554	Exec Advisor 4	$60,339.98	1.00	see previous
0843	Academic Coordinator	$56,377.53	1.00	see previous
1099	Admin Stipend	$207,123.95	1.00	see previous
1243	Asso Professor	$75,229.10	1.00	
1681	Lec PSOE	$57,898.88	1.00	
1989	Prof Researcher Bus/Mgmt/Eng	$124,918.99	1.00	see previous
3205	Academic Researcher	$594,202.36	1.00	
3215	Academic Assoc Researcher	$334,695.40	1.00	
3220	Asst Researcher	$194,089.75	1.00	see previous
3225	Professional Research	$110,576.50	1.00	see previous
3252	Post Doctoral Scholar	$1,176,820.34	1.00	see previous
3266	Graduate Student Researcher	$307,297.79	1.00	
3276	Graduate Student - Partial Fee Rem	$660,470.09	1.00	see previous
3320	Asst Specialist	$20,758.62	1.00	
3330	JR Specialist	$16,524.40	0.50	
3390	Project Scientist	$200,678.35	0.75	see previous
3391	Project Scientist	$218,662.79	1.00	see previous
3392	Asso Project Scientist	$273,433.88	0.50	see previous
3394	Asso Project Scientist	$68,628.72	1.00	
3395	Asso Project Scientist	$61,048.41	1.00	
4723	Blank Asst 2	$56,479.60	1.00	see previous
4724	Blank Asst 1	$19,823.69	1.00	see previous
4919	Student Asst 4	$74,637.21	1.00	see previous
4920	Student Asst 3	$144,766.72	1.00	see previous
4921	Student Asst 2	$50,208.10	1.00	see previous
4922	Student Asst 1	$16,340.32	1.00	see previous
5193	Fac Management Specialist 1	$1,240.99	1.00	
6206	Research Admin 3	$167,639.64	1.00	see previous
6256	Research Data Analyst 2	$134,146.07	1.00	

Totals for 2010-2015

Title Code	Position Name	Paid Amount	FTE	Paid Out of SNRI Office
7277	Program Analyst 2	$171,416.61	1.00	
7299	Applications Programmer 2	$96,457.37	1.00	
7371	Admin Asst 1	$23,167.79	1.00	see previous
7375	Admin. Supervisor 2	$198,298.90	1.00	see previous
7376	Admin Officer 2	$66,106.77	1.00	see previous
7377	Admin Officer 3	$150,188.85	1.00	see previous
7558	Bus Technical Support Analyst	$48,610.15	1.00	
7646	Admin Specialist	$141,101.30	1.00	see previous
7707	Financial Analyst 1	$8,989.28	1.00	see previous
7775	Buyer 1	$38,188.73	1.00	see previous
8214	Faculty Maintenance Supervisor	$131,292.98	1.00	see previous
9602	Lab Asst 3	$41,393.08	1.00	see previous
9603	Lab Asst 2	$96,647.58	1.00	
9605	Lab Asst 1	$153,379.75	1.00	see previous
9610	Staff Research Asso. 4	$262,794.08	1.00	
9611	Staff Research Asso. 3	$686,352.04	1.00	see previous
9612	Staff Research Asso. 2	$439,326.49	1.00	
9613	Staff Research Asso. 1	$87,405.29	1.00	
	Total	$8,560,468.49	0.98	