DEPARTMENT OF BIOLOGY
SF State University
1600 Holloway Avenue
San Francisco, CA 94132
415-338-1548/1549
biology@sfsu.edu
http://biology.sfsu.edu

Editor: Colleen Francis
silver@sfsu.edu

INSIDE THIS ISSUE

A Message to Alumni & Friends from Dr. Laura Burrus, Department of Biology Chair

We are now nearing the end of my first year as Chair of the Department of Biology. To be in a position of such tremendous impact has been an amazing and humbling experience. It is a privilege to be in a position to make a positive impact on our Department, University and Community.

The San Francisco State University motto "*Experentia Docet*" embodies the Department of Biology's commitment to engaging both undergraduate and graduate students in independent research projects. For a budding scientist there is nothing that can match the experience of doing your first beach seine, imaging your first cells, visiting the desert for the spring bloom, or analyzing your first sequence data. The experiential nature of science draws in the curious mind and does not let go.

It should come as no surprise that involving students in research is a high impact practice. Data from our College of Science & Engineering show that roughly 16% of all freshmen participate in an independent study research course. Students who engaged in at least one of these courses were nearly twice as likely to graduate than those who did not, with an impressive 92% graduation rate for those who had the opportunity to engage in research. A college degree is a ticket to a better life. Thus, each additional student that has graduated because of their experience doing research represents a life changed. And each student who graduates with a degree in science represents a critical voice in a world where evidence-based science and decision making is increasingly undervalued.

Undertaking meaningful research takes time – lots of time. As a dear friend of mine from graduate school used to remind me, "that's why they put the *re* in *re*search." Unfortunately, time is a luxury that our students who are working their way through college simply do not have. The need to generate income necessarily outweighs the desire to push back the frontiers of science.

Because of the profound impact that research experiences have on the trajectory of our students, we are proud to launch our BioLuminary Fund. This fund will provide support for students who wish to engage in research over the summer, when students can fully focus on their research in the absence of competing academic demands. If you are looking for ways to have a positive impact, we ask that you consider investing in our BioLuminary Fund. Your donation will help us cultivate amazing BioLuminaries, like Frederick Santana, who is featured on page 2.

"This was the best science class I have ever taken...Heather is ... passionate about what she teaches...she connects the class to our everyday lives."

Out of the top 20 most rated SFSU professors on RateMyProfessor.com, Lecturer and alumna **Heather Murdock** ***(MA Ecology & Systematic Biology 1999)*** received the highest rating with a 4.9/5.0. Heather joined Biology in 2001 and teaches Human Biology for non-majors and coordinates the Introduction to Biology II labs. She received Biology's first Outstanding Lecturer Award in 2009. When not in the classroom she plays soccer with students on Fridays from 12:10 - 1:00 on the turf fields (anyone is welcome to join) and leads cultural tours to Europe during the summer (June 2019 will be France and Spain), and Biodiversity tours to Costa Rica over winter breaks. Anyone over 17 is welcome to join the tours. For more information, email: hgmurdock@yahoo.com

Trisha DeVera is the recipient of the Don Eden Staff Appreciation Award in recognition of her work supporting research within the College of Science & Engineering (CoSE).

"I am the Program Administrator for SEPAL (Science Education Partnership and Assessment Laboratory) and the SEPAL Resource Center Manager. I plan, direct and coordinate several grant funded programs, and manage program staff, budgets, accounting for expenditures and in some cases, assist with writing grant reports. I observe program activities, collect data and create reports which are used towards future funding.

I also supervise 2-3 students every semester to coordinate, administer and support a lending library of science materials which are used by SF State Faculty and Bay Area Elementary, Middle and High Schools, and Community Colleges.

After 21 years of working at SF State, I continue to enjoy learning and growing with my fellow colleagues and students. I put my heart and soul into my work at SEPAL, and to have been rewarded by the CoSE truly means the world to me. It can be a demanding role at times, and to know that my hard work has been recognized is very humbling."

The SF State Department of Biology is thrilled to launch a new **BIOLUMINARY PROGRAM** to provide financial support to students wishing to engage in hands-on research in labs over the summer.

Our Promise

The Biology Department Fund promises to support three BioLuminaries during the 2018 summer.

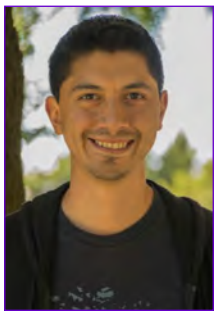
Join Us

Join us by supporting the BioLuminary program. You will enable both first-year and returning students to engage in the excitement of hands-on scientific research. This is an essential milestone for their future academic and professional careers. Students will be awarded up to $5,000 each for this incredible opportunity.

Track Your Donation

You will be able to track the difference your donation has made as you will receive a photo and a written note from a BioLuminary. We will also feature select students in future issues of *BioNews*. All College of Science & Engineering (COSE) donors that have provided life-time gifts that total $500 or more will be invited to the Fall 2018 COSE Donor and Scholarship Appreciation Dinner where our BioLuminaries will be there to meet you in person.

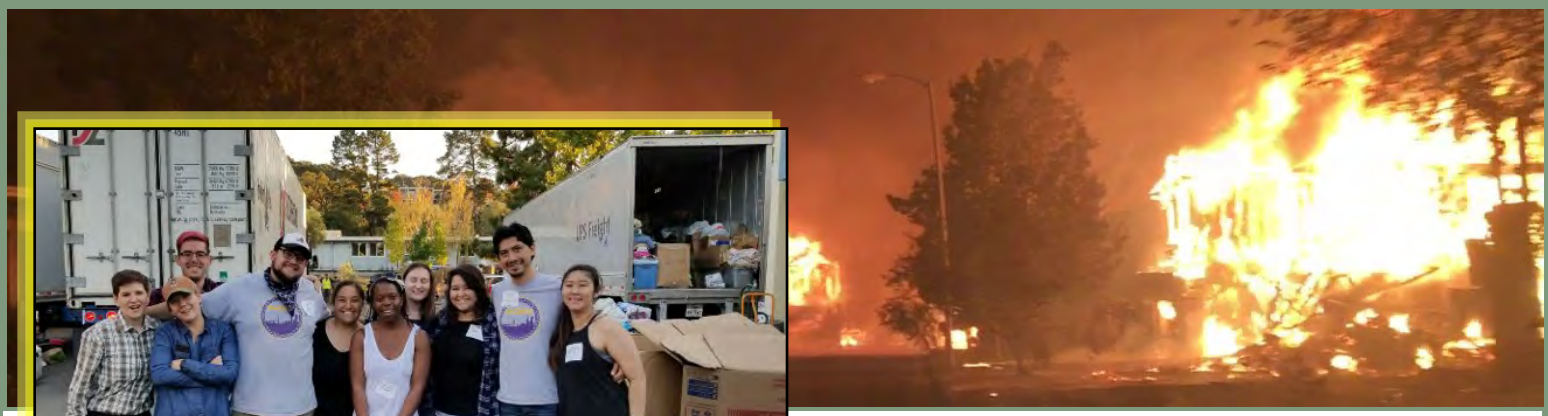
Fund a BioLuminary like Fred Santana



Frederick Santana
BS Microbiology 2015
MS Cell & Molecular Biology Candidate 2019

"During my first summer research experience I was able to create and develop projects I was interested in which is something you don't get to do in lab courses. I created a project I really cared about and learned about many different ways to approach a question. This has given me confidence in my abilities as a scientist and inspired me to continue on pursuing a Ph.D. — something I never would have imagined prior to this experience."

Please support the BioLuminary Program by selecting "Biology Department Fund" on the enclosed envelope or by visiting: http://give.sfsu.edu/bionewsspring2018
For questions about the BioLuminary Program and other programs in need of support, email Biology Chair, Dr. Laura Burrus, at lburrus@sfsu.edu



L-R: Virginia McBride, Katie Koho, William Chadwick, Samuel Goodfellow, Jessica Bolivar-McPeek, Cecelia Brown, Emily Conrad, Miriam Valenzuela, Frederick Santana, and Adrienne Le

On October 8, 2017 one of the most destructive wildfires in the U.S., the Tubbs Fire, roared through Calistoga to Santa Rosa consuming 137 square miles in Sonoma County, killing 24 people and untold numbers of animals, destroying more than 5,100 homes and wildlife habitats.

Graduate Cell & Molecular Biology major and SACNAS (Society for Advancing Chicanos/Hispanic & Native Americans in Science) member **Jessica Bolivar-McPeek** learned that a sister of her on-campus Residential Life Supervisor, Katie Koho, lived in the area of Santa Rosa that had been impacted. She asked SACNAS President and graduate Cell & Molecular Biology major **Sam Goodfellow** if the SACNAS group would like to help out. Members quickly agreed to participate in the recovering efforts because many had family and friends who were affected by the tragedy. They gathered food and supplies, and Biology professor **Dr. Blake Riggs** *(photo right)* helped finance additional materials. "We drove to the Redwood Empire Food Bank in Santa Rosa because it was one of the main sources in the area for food," said Jessica. "We also searched several assistance setups in hopes to volunteer in whatever way possible, and found that the Teamsters Local 665 were active in taking donations and allocating them to those in need. We sorted clothes, unloaded trailers of donations, handed out hygiene products, toiletries and food."

"My most memorable moment while volunteering at the Teamster's location was in the midst of unloading and sorting drop-offs given by the community," recalls Sam Goodfellow. "I stopped to witness the collaboration and communal effect of strangers coming from different locations for a cause that needed attention. I saw my fellow colleagues breaking sweat and filthy sorting through items, and they were so inspiring. We were just students, but I felt bigger than that. We were making an impact and literally seeing the immediate effects which is more satisfying than I can possibly place in words."

SACNAS was established as a national organization over 40 years ago to increase diversity within the Science, Technology, Engineering and Mathematics (STEM) fields. The SF State Chapter was formed in 2013 by **Marco Monroy *(BS Cell & Molecular Biology 2015)*** and **Monet Jimenez *(BS Cell & Molecular Biology 2015)***. Today, the SF State Chapter has over 40 student and 20 alumni members. To bring students together SACNAS members organize social events which include Game Nights, End-of-the-Semester potlucks, and an annual BBQ with the UCSF SACNAS Chapter. The group participates in the College of Science & Engineering's professional development opportunities which include workshops on preparation for Ph.D. and other higher education programs. Community outreach is a core part of their mission, and members travel to Bay Area schools bringing science experiment demonstrations using foldable microscopes to view samples, presenting lab model organisms, and mentoring Bay Area underrepresented youth.

Last Fall, SACNAS members also rose to the challenge of helping those affected by the Tubbs Fire. When asked what her most memorable moment was during the time she spent working on relief efforts, Jessica replied, "talking to folks affected by the fires and listening to their stories. I was extremely fortunate to be present with them."

L-R: Dr. Karina Nielsen, Byron Riggins, and Chelsey Wegener

Dr. Karina Nielsen, Director of the Estuary & Ocean Science Center (formerly the Romberg Tiburon Center for Environmental Studies) was made a California Academy of Sciences' Fellow in recognition of her notable contributions to science. Her research focuses on coastal margin ecosystems which include rocky shores, sandy beaches, surf zones and estuaries. "I am interested in finding solutions to scientific and management problems related to climate change, conservation and sustainable use of living resources," said Dr. Nielsen. "I enjoy working on complex puzzles, am very fond of nature and think it is our responsibility to leave our children a healthy planet where they can thrive."

Before deciding to become a biologist, Dr. Nielsen studied fine art photography and filmmaking at Hampshire College. "I had an internship with a commercial photographer and did a special physics project, but decided I didn't really want to be a photographer — fundamentally, I am a biologist. Being an educator and a scientist is core to who I am and what I do."

Dr. Nielsen earned a PhD in Zoology from Oregon State University, and was a Professor of Biology at Sonoma State University where she taught invertebrate biology, marine ecology, marine botany, oceanography, statistics for ecologists and seminars on science and the media, philosophy of science and marine conservation. "I started as Director of the EOS Center in 2014 when I still had sand between my toes from a summer of biodiversity sampling on northern California beaches to establish the baseline ecosystem state of beaches inside and outside of California's newly established marine protected areas."

The Center currently houses labs and offices of faculty from Biology, Earth & Climate Science, Chemistry & Biochemistry, Geography & the Environment and Physics & Astronomy who teach marine science, field-based courses and head independent research projects and programs. "I am especially proud of our new MS program that we created with funding from the NSF Research Trainee program called RIPTIDES (https://riptides.sfsu.edu) which supports MS students pursuing interdisciplinary research," said Dr. Nielsen.

Asked about her future goals, Dr. Nielsen replied, "I am imaging the day when we will have realized more of the extraordinary potential for the EOS Center to become a leader in interdisciplinary research for the SF Bay and nearby coastal ecosystems. We have already built close collaborations with the SF Bay National Estuarine Research Reserve and the Smithsonian Environmental Research Center — so close they have become part of the new Center."

"The Romberg Tiburon Campus also has an amazing story to tell. We just had a historic evaluation done and there are wonderful opportunities for interpretation and education based on the environmental and cultural history of the campus and its surroundings."

For more information about the Estuary & Ocean Science Center, visit: eoscenter.sfsu.edu

The Romberg Tiburon Center for Environmental Studies Campus *Photo by Erin Blackwood, 2010*

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We are so thankful to all of you. Your generous gifts enabled us to continue in our long tradition of excellence in teaching, mentoring and research. Thank you for being a part of SF State's Department of Biology community.

Advancing Global Health and the Biosphere: Educating Generations of Scientists, Health Professionals, Teachers and Citizens

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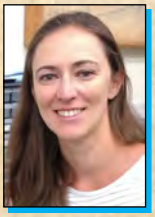
Brenda Cisneros ***(BS Physiology 2013)*** is pursuing a Ph.D. in Molecular & Integrative Physiology at the University of Michigan where she was awarded a prestigious NIH Career Training in Reproductive Biology T32 grant.

Kathryn Danielson ***(MS Marine Biology 2013)*** is a Program Strategist at Beyond, an international technology and ideas agency. She designs learning and training experiences that support retail sales associates who sell Google hardware products.



Tricia Goulding ***(MS Marine Biology 2011)*** earned a Ph.D. from Pennsylvania State University. She is a NSF-funded Postdoc at the Bernice Pauahi Bishop Museum in Honolulu where she is working on a revisionary molluscan systematics of Pacific Island land snails.

Briana McCarthy ***(MS Ecology & Systematic Biology 2008)*** is a tenured Biology faculty and Student Learning Outcome Coordinator coaching individuals and teams of faculty in writing outcomes, designing assessments, analyzing data and brainstorming high impact pedagogical practices to address course and program needs at Los Medanos College.

Brian Perry ***(BS Ecology 1996; MA Ecology & Systematic Biology 2002)*** earned a Ph.D. in Organismic & Evolutionary Biology from Harvard University, and is the Chair of the Department of Biological Sciences at CSU East Bay.

Cassie Pinnell ***(MS Ecology & Systematic Biology 2016)*** is a Senior Ecologist and Sacramento Office Lead of Vollmar Natural Lands Consulting, a California-based natural resources consulting and research company.

John Rodriguez ***(MS Cell & Molecular Biology 2016)*** is a full-time, tenure-track Biology Instructor at Merritt College.

Jeff Schinske ***(MS Ecology & Systematic Biology 2008)*** is a Biology instructor at Foothill College and recipient of the 2018 Outstanding Undergraduate Science Teaching Award from the Society for College Science Teaching in recognition of his teaching excellence, scholarship and service.

Dr. Jenny Carlson ***(MS Ecology, Evolution & Systematic Biology 2010)*** was awarded a prestigious 2018 Christine Mirzayan Science and Technology Policy Graduate Fellowship sponsored by the National Academy of Sciences. The program is designed to help Fellows develop basic skills essential to working on science policy at the federal, state and local level.

"I have a vision of improving the sphere of decision making at the local, national, and international leadership levels based on measurable and rigorous scientific criteria. This Fellowship is giving me the opportunity to explore if I can accomplish my vision.

In the past couple of years I have participated in an array of activities including working as a volunteer for the CDC Lyme Corps, a public outreach program in Maryland for Lyme disease prevention. I handed out Lyme disease prevention information at a local farmers market, wrote an article that was published in newsletters for runners and birders, and gave presentations to community groups. I also had the opportunity to speak in favor of genetically modified mosquitoes at a town hall meeting in Key West, Florida during the Zika virus outbreak. As the Vice-President of the Johns Hopkins Science Policy Group, I organized and participated in advocacy events where we wrote and called our representatives about important issues such as health care, funding science, and taxing graduate students.

While at SF State I was involved with SEPAL (Science Education Partnership & Assessment Laboratory) as a Fellow funded by the National Science Foundation GK-12 Partnership Program Award. Dr. Kimberly Tanner assigned me to Hill Top High School in San Francisco, a school dedicated to pregnant teenagers. Through her lessons and my experience teaching the students I furthered developed my communication and teaching skills. These skills were, and have been, essential in shaping the way I strategize and communicate important scientific findings to the public and to leaders assigned to the task of making decisions for our communities and our nation. For this, I am eternally grateful for SEPAL and to Dr. Tanner in helping me become the person I am today, and I hope that her work will continue to develop and shape future students and leaders."

Ray "Bones" Bander ***(Biology 1958)*** passed away December 23 at the age of 90. He was a high school science teacher and naturalist who collected 6,000 animal skulls which he gifted to the California Academy of Sciences.

Jody Rake

BS Zoology 1987

"I majored in biology at SFSU, with an emphasis in zoology, because I wanted to work with animals for as long as I can remember. I had the pleasure of assisting one of Dr. Hal Markowitz's graduate students in a behavioral study of marine mammals at the Steinhart Aquarium. Two of the courses I took, 'Natural History of Vertebrates' taught by Dr. James Mackey and a 'Comparative Anatomy of Vertebrates', fueled my passion for biology. Although it was more than 30 years ago, a lot of that knowledge has stuck with me and I still draw on it when writing manuscripts.

The year after I graduated I relocated to San Diego and was hired by SeaWorld in 1989. I started in the Education Department, and planned to work my way into the mammal department. In the meantime, I became aware of the science writing staff, who produced animal information for training purposes and booklets sold in the gift stores. My fascination led to a change of heart and a new career goal. I took technical writing courses at night and earned a certificate from Mesa Community College.

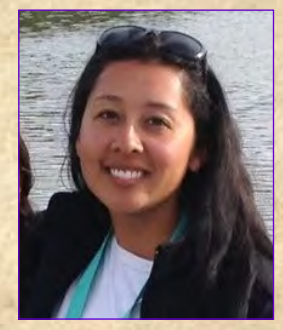
After a brief internship at SeaWorld, I became a full-time science writer. In 2001, children's publisher, Capstone Press, approached SeaWorld about doing scientific consulting for their sea animal books. I took over this task, and soon started writing manuscripts for them.

After 14 years at SeaWorld, I decided to go freelance and work as a contract writer for Capstone. To date, I have had 81 titles published, mostly about animals.

I am a proud SF State Biology alum and still passionate about Biology, but as a technical writer I have learned that while science courses are vital, not to underestimate the value of composition courses. And, just because I deal in non-fiction, it doesn't mean it has to be dry and vanilla. I recommend that aspiring technical writers look into books and/or workshops that instruct in the art of creative non-fiction."

Editor's note: To learn more about Jody's publications, visit:

https://www.amazon.com/s/ref=nb_sb_noss?url=search-alias%3Daps&field-keywords=jody+rake



Riley Smith

BS Ecology & BA American Indian Studies 2014

"I am of Shoshone-Bannock (Newe) descent and the Program Coordinator in the Environmental Waste and Response Department at the Institute for Tribal Environmental Professionals (ITEP). At ITEP, we are working with Tribes to reduce exposures to hazardous chemicals, protect cultural traditions, clean up the mess, and organize trainings.

There is a long history of industrial and government agencies conducting natural resource extraction, processing, and disposal on and near Tribal Nations. On the Shoshone-Bannock Reservation, where my family is from, an abandoned phosphate mine is on a list of the U.S.'s most contaminated sites. Uranium mining has contaminated the lands of the Spokane, Lakota and Navajo, automotive and industrial plants have polluted the rivers of the Akwesasne Mohawk and Tribes downstream, and nuclear waste disposal is impacting Pueblos in New Mexico. These contaminants are affecting the health of Indigenous Nations, and I'm glad I'm with ITEP finding solutions.

I am interested in finding ways to link Indigenous environmental science and western environmental science. They both highlight the need for sustainable solutions, but many times they have different methods for the solutions. At SF State, I learned history and its affects on Native communities today from American Indian Studies Department teachers including Drs. Nelson, Klasky, Collins, Jolivette, and Dumont. I loved the community service learning credits which gave me the opportunity to work with community organizations and understand current Native issues and solutions. Those volunteer hours are some of my favorite memories!

I was introduced to research through SF State's Research Initiative for Scientific Enhancement (RISE) program and Dr. Frank Bayliss who is a great mentor! When we presented research at the Society for Advancement of Chicanos and Native Americans in Science (SACNAS — *see page 3*) conference, Dr. Bayliss showed us the ropes. And with help from RISE and the Louis Stokes Alliance for Minority Participation faculty including Drs. Baird and Ellis, I was able to present at the American Indian Science and Engineering Society conference fulfilling a dream of going to Alaska!

I often refer to my course notes from Dr. Leticia Márquez-Magaña's 'Research Skills' and Dr. Tomoko Komada's 'Chemistry Behind Environmental Pollution.' Both Drs. Sarah Cohen and Tendai Chitewere's support and the Climate Change Scholars Program (Jamie Chan) helped guide me on my sea-star research project, and now we have a published paper! Dr. Cohen also connected me with Wienke Tax at the EPA who introduced me to ITEP's work at Northern Arizona University where I attended graduate school and got involved with ITEP."

To learn more about ITEP, visit:
https://www7.nau.edu/itep/main/Home/

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ALUMNI PUBLICATIONS

A bioluminescent mushroom (*Mycena lucentipes*) discovered by SF State Biology Professor, Director of the Harry D. Thiers Herbarium and alumnus **Dennis Desjardin** ***(BS Biology 1983; MA Ecology & Systematic Biology 1985)*** is the first mushroom ever to grace a U.S. postage stamp and was included in a 2018 series which celebrates the phenomenon of bioluminescence — the ability of some species to glow.

CARLA SETTE ***(MS Physiology & Behavioral Biology 2010)***

is a Ph.D. candidate in Ecology and Evolutionary Biology at UC Santa Cruz. Her thesis "Reconstructing Historical and Contemporary Disease Dynamics: A Case Study Using the California Slender Salamander" was published in *Biological Conservation*.

ALICIA BIRD ***(MS Physiology & Behavioral Biology 2016)***

is in the Graduate Group in Ecology at UC Davis studying the impacts of noise pollution on local birds. Her Master's thesis "Skin Microbiomes of California Terrestrial Salamanders are Influenced by Habitat more than Host Phylogeny" was published in *Frontiers in Microbiology*.

We want to hear from our alumni! Let us know about your academic/scientific/professional achievements, and/or share a memory of your time at SF State. Email silver@sfsu.edu