Bios

The Biology Department Newsletter
Fall 2004
Volume 20, No. 1

Editor: Paul Wilson Publisher: Jim Dole

For back issues & more information about Biology Dept., see *www.csun.edu/biology.*

California State University Northridge

California State University, Northridge

Marine Biologists Receive Long-Term Ecological Research Grant

Drs. **Robert Carpenter** and **Peter Edmunds** heard last month that their application to the NSF-LTER (Long Term Ecological Research) program was successful, which means they will be sharing a $4.6 million grant with two colleagues from UC Santa Barbara (Drs. Russ Schmitt and Sally Holbrook) that will allow them to establish an LTER site in French Polynesia. The NSF-LTER program was initiated in 1980 with the goal of establishing long term (30+ years), multidisciplinary analyses of important biomes (*www.lternet.edu*). The award to Drs. Carpenter and Edmunds initially covers a six-year period, but funding experiences of other LTER sites suggest they can expect the grant to be renewed over the long term. To date, 26 LTER sites have been established throughout the US, and in 2004 the NSF decided to establish another coastal/marine LTER.

Says Dr. Edmunds, "It is hard to over estimate the biological significance of the LTER system, or the intense competition for one of these grants. Biologically, LTER sites likely will become the national focus of attention on biome structure, function and change, and are intended to attract other researchers who will bring additional funding and research skills to the project." According to Dr. Carpenter, "The Moorea Coral Reef (MCR) LTER will be structured to exploit the teaching-oriented, minority-serving status of CSUN by forging research and teaching exchanges with UC Santa Barbara."

The grant will allow the establishment of a program to monitor the biological and physical attributes of the coral reefs of Moorea, an island near Tahiti, and to support process-oriented experiments to understand the causal mechanisms of change. Says Dr. Edmunds, "In its fully developed form, the award will include another 14 faculty who bring a diversity of skills to the project ranging from oceanography to molecular biology."

There will also be opportunities for CSUN Master's students to take on various roles in the project, followed by Ph.D. studies at UCSB. Drs. Carpenter and Edmunds will spend the fall planning the project, which will include meetings with other LTER faculty, the recruitment of new students to work on the project, and the hiring of a technician to support the fieldwork and laboratory analyses. They expect to make their first research trips to the island in spring 2005.

For the two professors the award promises to be one of the great accomplishments of their careers. According to Dr. Edmunds, "Being selected to establish an LTER site is truly a career-making development, and one that will firmly place the CSUN Biology Department and its Marine Biology Program on the international map of academic research excellence." For CSUN/UCSB to have beaten stiff competition for this grant from numerous major research institutions makes the successful outcome all the more impressive.

New Publications* by Biology Faculty and Their Students

Dr. **Robert Espinoza** has co-authored two papers published in *Copeia*: "Two new *Liolaemus* from the Puna region of Argentina and Chile: Further resolution of purported reproductive bimodality in *Liolaemus alticolor* (Iguania: Liolaemidae)," with F. Lobo; "Voluntary hypothermia: Constraints of herbivory in the desert iguana, *Dipsosaurus dorsalis*," with C. R. Tracy, K. M. Flack, L. C. Zimmerman and C. R. Tracy.

Maria Castellanos, our Dr. **Paul Wilson**, and James Thomson have had a paper published in *Journal of Evolutionary Biology*: "'Anti-bee' and 'pro-bird' changes during the evolution of hummingbird pollination in *Penstemon* flowers." Dr. Wilson is also one of five authors of a chapter, "Forest landscape patterns, structure, and composition," in a book called *Forest in Time*.

Dr. **Pete Edmunds**, **J**. **F**. **Bruno**, a former student, and D .B. Carlon authored, "Effects of depth and microhabitat on growth and survivorship of juvenile corals in the Florida Keys," in *Marine Ecology Progress Series*.

Graduate student **Amanda Izzo** and Dr. **David Gray** wrote, "Cricket song in sympatry: Species specificity of song without reproductive character displacement in *Gryllus rubens*," which appeared in *Annals of the Entomological Society of America.*

Students **Jana Cobb**, **Brooke Gintert** and Drs. **Larry Allen** and **Daniel Pondella** (adjunct professor) had a paper in *Journal of Biogeography*: "The biogeography of nearshore rocky-reef fishes at southern and Baja California islands."

"Construction and use of GFP reporter vectors for analysis of cell-type-specific gene expression in *Nostoc punctiforme*" has been accepted for publication in the *Journal of Microbiological Methods*. The

* Readers will find full citations & often PDFs at *www.csun.edu/biology/faculty*.

authors are **Claudia Argueta** (former M.S. student in microbiology, now research technician), **Kamile Yuksek** (previous grad student, now in a Ph.D. program at USC), and Dr. **Michael Summers**.

Research Talks and Posters Presented at National Meetings

Dr. **Randy Cohen** and his students presented three posters at the Experimental Biology meeting in Washington, D.C. •Undergrads **Thiago Halmer**, **Don Reeder** and **Vernita Davis** presented "The role of nitric oxide in intracellular mechanisms of epileptogenesis." •Grad student **Erin Mettlen** presented "Phospholipase A2 as an effector of the neuroprotective effects of nicotine in the *spastic* Han-Wistar rat." •Undergrad **April Ochoa** and grad student **Jorge Iniguez** presented "Possible neuroprotection in the *spastic* Han-Wistar rat mediated by altered CB1 receptor expression and cannabinoid treatment."

Dr. **Steve Oppenheimer**'s lab was also represented at the Experimental Biology meetings. •Students **Maria Khurrum**, **Astrid Hernandez**, **Melika Eskalaei**, **Oliver Badali**, **Ever Flores**, **Nasim Monajemi**, **Alma del Llano**, **Maribel Alvarez**, **Hesam Hekmatjou**, **Liron Shiri**, together with **Drs**. **Cathy Coyle-Thompson** and **Oppenheimer** presented "Carbohydrate involvement in sea urchin cellular interactions and isolation of molecules that influence cellular interactions in the sea urchin gastrula model." •**Daniel Semuha**, K-12 teacher **Greg Zem**, and Dr. Oppenheimer presented "Binding of immobilized concanavalin A to cells: Effects of ion concentrations."

Multiple Biology students presented their research at the Benthic Ecology Meetings in Mobile, Alabama. Dr. **Robert Carpenter**'s students **Graham Ferrier** and **Jacqueline Padilla-Gamiño** gave oral presentations, while **Kylla Benes**, **Annaliese Hettinger** and **Kathy Morrow** presented posters; undergrad **Cassie Walsh** also attended. Dr. **Peter Edmunds** gave a talk, and his grad student **Robin Elahi** presented a poster. Drs. **Steve Dudgeon** and **Janet Kübler** presented their research on the hypothesized effects of fertilization rate on the evolution of algal life histories. In addition, Dr. Dudgeon presented a paper with Dr. P. S. Petraitis of the University of Pennsylvania, and his grad student **Becca Kordas** presented preliminary findings from her work on latitudinal variation in the interaction between barnacles and rockweeds.

At meetings of the Ecological Society of America, Dr. **Paula Schiffman**'s student, **Jolene Pucci**, gave a poster, "Examining multiple impacts of exotic species on a rare plant community." Her co-authors were Dr. Christy Brigham and John Tiszler of the Santa Monica Mountains National Recreation Area. At the same meetings, Dr. **Robert Carpenter**'s student, **Jacqueline Padilla-Gamiño**, spoke on "Temperature acclimatization in a red alga from California and Hawaii." Jackie presented similar material at the CSU systemwide Student Research Competition.

Grad students **Kylla Benes** and **Kathy Morrow** gave oral presentations on their research at the USC Wrigley Marine Science Center, Santa Catalina Island. Both work in Dr. **Robert Carpenter**'s lab.

From Dr. **Peter Edmunds**' lab, grad students **Laurie Allen-Requa** and **Geoff Horst** gave talks at the American Society of Limnology and Oceanography meetings in Honolulu.

At the Animal Behavior meetings in Oaxaca, Dr. **David Gray** and erstwhile undergrad **Christina Banuelos** gave a poster, "DNA divergence among parasitoid fly populations utilizing different cricket host species." Dr. Gray's grad student **Amanda Izzo** also gave a poster: "Where have all the hybrids gone? Looking for evidence of conspecific sperm precedence in two species of field crickets." Dr. Gray also gave a talk at the Southern California Animal Behavior Conference on "Distinguishing modes of selection on courtship interactions: Sexual selection versus species isolating functions."

The Biology Department had a good showing at meetings of the American Society of Ichthyologists and Herpetologists. Papers, with only the presenting author listed, included: •**Kamelia Fallahpour** on "Colorblind courtship in male leopard lizards: Is female coloration relevant?" •Dr. **Larry G**. **Allen** on "Documenting the return of a fishery? Abundance of juvenile white seabass (*Atractoscion nobilis*) off southern California 1995-2003." •**John Froeschke** on "The fish assemblages inside and outside of a marine reserve at Santa Catalina Island, California." •**Joshua Lindsay** on "Temporal patterns in the settlement of cryptic reef fish." •**Eric Miller** on "Aspects of the life history of the black croaker (*Cheilotrema saturnum*) from within the Southern California Bight." •**Matthew Salomon** on "Gene flow among spotted sand bass, *Paralabrax maculatofasciatus*, populations within the Southern California Bight." •**Stevie Adams** on "A comparison of distribution and abundance patterns of rocky intertidal fishes in southern California." Fallahpour works with Dr. **Robert Espinoza**, the other students with Dr. **Larry Allen**. All students who attended the "Ichs and Herps" meeting received travel funds from the Department, the College of Science and Mathematics, and the Office of Graduate Studies.

At the 8th Cyanobacterial Molecular Biology Workshop, Dr. **Michael Summers** presented a talk on cellular development in cyanobacteria: "Identification and analysis of akinete specific genes in *Nostoc punctiforme*."

Two grad students presented posters at the American Society for Microbiology meeting. **Peter Holmquist**'s topic was "Cyclic adenosine monophosphate receptor protein in the cyanobacterium *Synechocystis* 6803 is required for optimal growth in high light"; Peter works with Dr. **Michael Summers**. **Raquel Martinez**'s poster was entitled "Molecular analysis of microbial populations from total soil DNA"; Raquel is in Dr. **Larry Baresi**'s lab.

—**see Talks, page 6**—

Marine Biologists Active Worldwide

Edmunds, Carpenter: Urchins

June 2004 saw the final Caribbean trip for Drs. **Peter Edmunds** and **Robert Carpenter** as part of their National Geographic Society sponsored research to assess the extent of region-wide recovery of sea urchin populations. This project grew out of earlier discovery of large numbers of the black sea urchin (*Diadema*) in the shallow waters along the north coast of Jamaica. The observation was notable because this ecologically important sea urchin had died off throughout the region in 1983, and its loss precipitated a long-standing dominance of the reefs by algae rather than coral. After surveying reefs between Bonaire and Belize the duo have data that suggest this important sea urchin is staging a Caribbean-wide recovery.

Dudgeon: Genetic Workshop

Dr. **Steve Dudgeon** was invited to participate in the 3rd CORONA conference on trans-Atlantic taxa. This year the meeting was held in Plymouth, England, at the Marine Biological Association of the U.K. Says Dr. Dudgeon, "Our lab continues our work with colleagues at Queen's University in Belfast studying the red alga *Mastocarpus*, a genus that has both Pacific and Atlantic species, and an excellent complex for studies of geographic variation in life cycles."

Dr. Dudgeon also attended a two-week workshop at the European Institute of Statistical Genetics in Faro, Portugal at the University of the Algarve. There he took three modules taught by the statistical genetics group at North Carolina State—Population genetic data analysis, Interpreting DNA evidence (a course for forensic investigators and for evolutionary ecologists), and Coalescent theory—each three days long with 6.5 hours of lectures and a couple hours of lab, plus homework. "Needless to say," Dudgeon comments, "it was very intense. Fascinating but intense."

Edmunds: Caribbean Corals

For the eighteenth year, Dr. Edmunds and his research team traveled to St. John (Virgin Islands) where they study the long-term dynamics of coral reef communities. **Laurie Allen-Requa, Robin Elahi** and **Mai Maheigan** assisted in the annual monitoring and tackled portions of their M.S. research. High School teacher **Mark McLaughlin** accompanied the team as part of the broader outreach component of the project. He not only assisted with the SCUBA research, but with Dr. Edmunds explained reef ecology and provided an introduction to scientific research for the children from Caribbean islands. Mark also is preparing a lesson plan on reef ecology to be used in his high school.

Dr. Edmunds spent much of spring working in Jamaica as part of his sabbatical leave. The Jamaican stint was supported by the East/West Marine Biology Program of Northeastern University, in which he has been teaching since 1990. Graduate student **Robin Elahi** was also supported, and made good progress on his thesis research during the 10 weeks there. He is addressing age effects in small corals on physiology. Robin followed his winter research with a second month-long trip to Jamaica in the summer, this time supported with a grant from the Associated Students. **Laurie Allen-Requa** joined the team in Jamaica for two weeks to complete research for her thesis.

Carpenter: Tahiti Reefs

Dr. Carpenter was busy over the summer. After his Caribbean trips, he went to the Hawaii Institute of Marine Biology on Oahu to continue his project on how water motion affects coral reef primary production at different spatial scales. He was assisted with various studies by CSUN graduate students **Kylla Benes**, **Kathy Morrow**, **Graham Ferrier**, and **Annaliese Hettinger**, and by **Eliza Moore**, an undergraduate student at Northeastern University.

Carpenter is on sabbatical this fall. He will be back to Hawaii for a bit of data. Then in October and November, he will be at the University of Washington's Friday Harbor Lab where he will be a scholar in residence at the Helen Whitley Center. The aim of the visit is to prepare several manuscripts for publication. After a brief respite back in L.A., Carpenter will travel to Moorea in January 2005 to initiate research associated with the recently funded NSF Coral Reef LTER project (see lead story).

Alumni Mentor Students

In March, the newly formed Biology Alumni Chapter offered a mentoring session for current students. Biology alum **Susan Crowther**, Chapter president, and **Shellie Smith** of the Alumni Office organized the event.

During the evening attendees had a chance to talk one-on-one with successful professionals, all but one a graduate of the CSUN Biology Department. Represented among the alumni mentors were medical, dental, forensic, pharaceutical, forestry, and college teaching professionals. A similar event is planned for spring 2005.

Faculty Invite Students to Help in Research

Students interested in participating in Dr. **Steve Oppenheimer**'s research on cell interactions in development and cancer, are invited to his basement lab, Sc 2005. Dr. Oppenheimer, who says "This is a fun lab, very productive and full of comradery," welcomes all interested students to see what his research is all about.

Dr. **Larry Allen**'s Nearshore Marine Fisheries Research Progam (NMFRP) needs student help with field work. Dr. Allen invites students to "Come fish for science," and gain invaluable research experience. See Dr. Allen (677-3340) or **Josh Lindsay** (677-4037) in Sc 4112.

The Students' Forum

The following articles were written by students, this time both Master's students. Diana Andres works with Dr. Robert Espinoza. Jackie Padilla is finishing her thesis with Dr. Robert Carpenter. The editors encourage all students who have had interesting professional experiences to consider writing articles for future issues of Bios.

Vision Quest in a DNA Lab

—Diana Andres

I aspire to be a field biologist, so I was not looking forward to working on the molecular part of my thesis. But, as a recipient of a Sallie Cassanova Predoctoral Fellowship, I was given money to do an eight-week research internship at a Ph.D.-granting institution, and the perfect way to do this arose when Dr. Roderick I. Mackie, a leader in microbial ecology, agreed to let me work in his lab at the University of Illinois Urbana-Champaign.

My project with Dr. Mackie was to analyze the DNA in lizard feces to assess the gut endosymbiont community. In Dr. Espinoza's lab I have been studying the desert iguana, which unlike most lizards is herbivorous. I've switched the diet of some to crickets on the prediction that this should cause a change in the gut fauna. Dr. Mackie was interested because, having studied the gut bacteria of herbivorous Galapagos iguanas, he wanted to find out if the bacteria from the Galapagos land iguanas were more similar to those of the closely related marine iguanas on the same island or to the desert iguanas. Dr. Mackie generously provided funding beyond what I had, so that in deciding how many samples to analyze, as he put it, "Money ought not to be an issue."

To prepare myself for this venture, I enrolled in Dr. Stan Metzenberg's Recombinant DNA Techniques class. This class gave me both the basic lab skills and an excellent understanding of the methods that I ended up using when I got to Illinois. I'm grateful that I had this foundation because I was able to concentrate on other aspects of the project without getting hung up on basic procedures.

When I arrived on campus I was stranded with too many bags to carry. I called Dr. Mayuko Mori, a post-doc in Dr. Mackie's lab, who had offered to pick me up. Together we took my fecal samples—which I had nervously carried on the plane, hoping that I wouldn't get thrown off by security—to the lab freezer, and then I got settled into a dorm room. The next day I met Dr. Mackie, who gave me a tour of the lab and introduced me to everyone. In one week I was to present my project to the other researchers, so I got started right away, trying to find an extraction protocol for my samples.

The lab personnel included three professors—Drs. Mackie, Isaac Caan, and Bryan White—five post-docs, and a bunch of Ph.D., Master's and undergraduate students. Though this seemed like an overwhelming number of people, each one was really helpful. All were incredibly knowledgeable and experienced, each with his or her area of expertise, and very giving of their time. All of the professors were very approachable and encouraging—post-docs and students could knock on their door whenever they had a question, and they were always ready to help.

Another visiting researcher was Filipa Godoy, a Portuguese Ph.D. student studying in Puerto Rico, who studied the gut endosymbionts of the Hoatzin, a folivorous bird whose chicks have claws on their wings (like pterodactyls). Since neither of us knew anyone on campus, for the two weeks that she was there we had dinners together and talked about our research and plans for the future. It was great to exchange experiences and points of view. We each had our own bits of expertise that might help the other.

After Filipa left, life was a little lonelier, but I worked more than ever. It was not unusual for me to be at the lab until 3 am. Other researchers sometimes stayed even later. I busted my butt as consistently as I could, and I was floored when a deadline was approaching to find the post-docs still working when I dragged myself home.

The internship consisted of two months of feverish lab work extracting and analyzing bacterial DNA and a constant struggle to find something worth eating on a campus with only fast food. With no car or kitchen, my diet was worse than that of my lizards! Before I left, I presented a preliminary analysis of my microbial data. One exciting finding was that none of the bacteria from my lizards was found in the marine iguanas!

I had a great time and learned a lot, both about lab research and about life at a research institution. I was surprised to find that I even enjoyed the lab work I had been dreading! In fact, I was tempted when Dr. Mackie encouraged me to come to his well-funded lab to do a Ph.D. I valued my experience there and I have an immense respect for his knowledge and enthusiasm for his research, but at heart I'm a field biologist. Although it'd be easier to go for an amply funded assistantship working with people I already know and like, I've learned through more than one career change that I won't be happy unless I follow my own interests. It's scary and risky to look for space in an unfamiliar school, and funding will be more of a challenge in field biology, but this experience confirmed one thing for me: Though lab work may be an important part of my future research, I just must pursue my love of studying organisms in their natural habitats.

Jackie Goes to Washington

—Jacquelin Padilla-Gamiño

The following is a conversation with Jaqueline Padilla-Gamiño, a grad student of Dr. Robert Carpenter and a Fulbright scholar from Mexico. It will be helpful to know that Friday Harbor Lab is the premier field station for marine biology on the west coast. It's on one of the San Juan islands, between Vancouver Island and the mainland of Washington state.

Bios: Hey Jackie, where have you been?

JPG: I just got back from Friday Harbor.

Bios: Oh, if I had known, I would have had you bring back mosses for class. How were the San Juans?

JPG: Beautiful.

Bios: Are you doing research up there?

JPG: No, I was invited to this amazing symposium.

Bios: Invited? Wait, you're a grad student…

JPG: Yeah, I think one of the organizers had heard me give a talk last year, and they had money from the Mellon Foundation to invite some grad students and post-docs.

Bios: What was the symposium?

JPG: Look, here's the program. It was "Managing for resilience: An integrated approach to coastal marine science and conservation." It was the Centennial Celebration for the lab.

Bios: What's "resilience"?

JPG: It's like not stability. Most ecosystems are not stable because they are always changing, even naturally. But, maybe you would like to have an ecosystem that returns toward its natural state after being disturbed. We talked a lot about what people might manage for.

Bios: Who was at the symposium?

JPG: There were the most well known and important of senior marine biologists there. And the amazing thing about this symposium was that there were also big-time managers who advise the White House and work in government agencies. There were people who work at NASA making climate change projections. And there were people concerned with public education about the environment. And there were people from private foundations. The organizers were really good at bringing all these kinds of people together. Then there were the 15 Mellon scholars.

Bios: What did people present on?

JPG: Fisheries, disease outbreaks, ecotourism impacts, eutrophication. There were talks on changes in predator populations, and problems with species moving everywhere. But the symposium was about how people can actually manage systems. The problems are very complex, and we need to know very pointed things in order to manage in a positive way. A lot of the symposium turned out to be about how to be more active, not just publish studies that have vague "implications" for management. It's really important for the managers to understand the academics, but its also really important and hard for the academics to understand the managers, like if you come from a super strong science background.

Bios: You sound like you have a mixture of excitement and sobriety.

JPG: Yes. No. These people were really incredibly smart and accomplished, like they could do it all in their lives, and it was really fun, but yes, the world is getting warmer, for instance.

Bios: Did you give a talk?

JPG: I gave a poster about the ability of algae to acclimate to changes in water temperature. But then at the end the Mellon scholars got into groups. We made a rain-of-ideas, and then each group synthesized its best ideas, something for everyone to think about. I presented for my group. My group decided something important missing from the symposium was how ecological systems cross international borders. To promote resilience in ecosystems, there has to be international cooperation. The tunas travel everywhere. Management has to take into account different pressures on systems that differ from place to place because different cultures cause different problems. So international collaboration is extremely necessary. We asked for people to send us successful and unsuccessful stories of international management.

Bios: Overall what did you take away from the symposium?

JPG: It was an amazing experience. The symposium was very, very interesting for me and I think everyone. It was not just scientists talking about how we are going to manage, when scientists don't have the last word. This was an opportunity to facilitate, and so it was a good time to listen to the managers and talk with them. There were some things we didn't get to, but in the end we realized are crucial. For example, we need to take into account socioeconomic facts when we manage marine ecosystems.

Bios: Did you like Friday Harbor?

JPG: Friday Harbor was so great! Amazing place. Excellent food. They paid for everything. We could row to town—that was fun.

Bios: So, is that it?

JPG: I think we formed a good personal network, the Mellon scholars and some other people. We want to keep in touch, talking about these issues. We have an email chain. Maybe we'll plan another meeting. Have a reading group. The importance is huge. I felt like we were working on the problems of the world.

Biology—Ecology & Evolution Reading Group Formed

A reading group intended to "provide a forum for discussing the literature and project ideas in ecology and evolution," has recently been formed. The newly chartered group, the BEER Club, has elected **Kamelia Fallahpour** and **Jennifer Lancaster** as co-presidents and **Raymond Hernandez** as treasurer. Dr. **Robert Espinoza,** faculty advisor, says that "The club's activities will familiarize students with the ecological and evolutionary literature and enable them to hone their critical thinking and reading skills."

Among the faculty also involved in the club are Drs. Gray, Hertel, matos, Schiffman and Wilson. All students and faculty are encouraged to attend the group's meetings, typically on Mondays at 4:30 PM in Sc 1317. Snacks and soda are available at the meetings for a small charge. Call 677-5737 or email *jennifer.weist@csun.edu* for details.

The club also sells sodas and snacks in Sc 1328 with proceeds funding BEER Club events.

—Talks, con't from page 3—

At the meeting of Southern California Academy of Sciences, **Diana Andres**, a student of Dr. **Robert Espinoza**, presented on "Testing the cost of diet switching as the mechanism for the evolution of strict herbivory in lizards."

At the Evolution meetings, Dr. **Virginia Vandergon**'s grad students presented posters. **Mark Harris**'s was on "Loss of *accD* gene from monocots." **Sally Smith**'s was on "Molecular evolution of the chalcone synthase gene family in *Dubautia linearis*."

Student **Leslie Tirado** and Dr. **Maria Elena Zavala** were awarded a fellowship to attend the International *Arabidopsis* conference in Berlin. **Keri Silva**, a biochemistry major who worked in Dr. Zavala's laboratory won an award to attend the meetings of the American Society for Plant Biology where she presented the work that she had completed as an undergraduate student.

Students and Faculty Receive Grants, Scholarships, Supplies

In addition to the Long Term Ecological Research grant and the K-12 related grants mentioned elsewhere, several other grants have been received by indi-

Reminders from the Advisement Center

Advisement Center hours

Students are invited to stop by the Biology Advisement Center whenever they have questions about requirements. The advisors are Drs. **John Kontogiannis** and **Joyce Maxwell**, and graduate students **Diana Andres**, **Bridgette Nace**, **Robert Nohavandi**, **Ziba Razinia** and **Lily Welty**. All advisors are highly knowledgeable, thanks to Dr. Maxwell's training program (funded by the NIH minority programs). The Advisement Center, Sc2133, is open 39 hours per week with times posted on the door.

Advisement a must for spring

Before enrolling for spring semester, all Biology majors must be advised. Only then will Solar allow you to register. Students can avoid long lines by visiting the Advisement Center now and have their proposed program approved and a green slip signed. The Advisement Center will hold all green slips and turn them in at the appropriate time.

Plan to graduate in 2006?

Undergraduates expecting to graduate spring or summer 2006 must file Graduation Evaluation and Graduation Application forms not later than July 1, 2005. Students may have their forms completed at the Biology Advisement Center.

Upper-division Writing Exam required for graduation!

Students expecting to graduate must attempt the Upper Division Writing Proficiency Exam not earlier than the semester in which they have completed 90 units. Students planning to graduate in spring 2005 must pass the exam not later than April 15. For more information call the Testing office at 677-3303.

Accessing advisement info

An Advisement Handbook provides invaluable information on Biology requirements and course equivalencies. The free handbook can be obtained in the Advisement Center or at *www.csun.edu/biology*.

Career information available

Career sheets are available in the Advisement Center. Each sheet describes career opportunities associated with the various Biology options.

Terrestrial Eco/Evo's Impressive Stats

In 2003-04, Biology's terrestrial ecology and evolution (eco/evo) faculty and staff (Drs. **Jim Dole, Robert Espinoza, David Gray, Fritz Hertel, Cheryl Hogue, Jim Hogue, Jennifer Matos, Paula Schiffman, and Paul Wilson**) and their students published a whopping 28 peer-reviewed research papers. They also gave 23 oral and poster presentations. And they were collectively awarded a total of $729,117 in research and training grants. Individual student research awards, mostly in the $500–$1000 range constituted over $15,000 of this amount.

International travel to regions of ecological and evolutionary significance is an important activity for any ecologist because it informs our understanding of organisms and processes. The eco/evo faculty traveled to an impressive array of truly exotic locales for research and teaching purposes in 2003-04: Drs. Espinoza and Matos traveled to the Brazil's Amazonian Basin. Dr. Matos also visited the forests of four Hawaiian Islands (Hawaii, Oahu, Kauai, Maui). Dr. Gray visited Yucatan, Mexico, Drs. Hogue and Hertel explored Nicaragua and Dr. Hertel also worked in Costa Rica, Chile (Patagonia), and Cuba. Dr. Schiffman visited central Chile, Easter Island, and the Amazonian lowlands and Andean highlands of Ecuador.

These busy professors also continued to conduct research in California (e.g., Dr. Wilson in the Sierra Nevada Mountains, Drs. Schiffman and Matos at the Carrizo Plain), and elsewhere (e.g., Drs. Gray and Wilson in various parts of the southern United States). The upshot of these many adventures are inspired classroom and field experiences for CSUN's Biology students.

Closer to home, Drs. Schiffman and Wilson continue to work closely with National Park Service scientists in advising graduate student researchers in the Santa Monica Mountains National Recreation Area. The goal is to provide students both with great educational experiences at CSUN and opportunities to apply their know-how to real conservation biology problems. **Jolene Pucci, Joanne Moriarty** and **Tarja Sagar** are pursuing M.S. theses via this cooperative program.

viduals in Biology.

Three graduate students working with Dr. **Larry Allen** were awarded grants and donations to support their research. **Stevie Adams** was awarded a James R. Simpson Merit Scholarship ($1500) from the University to support her studies. **Bridgette Nace** received a Sigma Xi Grant-in-Aid ($800) to support her thesis project "Courtship behavior and mating system of the black perch, *Embiotoca jacksoni.*" And **Jonathan Williams** received a donation (worth $500) of PVC plumbing components from Freedom Plastics for the construction of his research apparatus at the Spotted Sand Bass Pilot Hatchery at Sea Lab in Redondo Beach.

Raymond Hernandez and **Kamelia Fallahpour**, students of Dr. **Robert Espinoza**, received Gaige Awards ($500 each) from the American Society of Ichthyologists and Herpetologists. Funds will support their studies of desert tortoises and leopard lizards, respectively.

Sally Smith received three awards: the Datatel Scholarship ($1,000), the Pearl Simmons Scholarship ($1,500), and a scholarship from the Students with Disabilities Resources ($1,000). **Mark Harris** received a travel grant from CSUPERB ($900). Both Sally and Mark work with Dr. **Virginia Vandergon**.

Three of Dr. **Robert Carpenter**'s students garnered grants. **Jacqueline Padilla-Gamiño** was awarded a Fulbright Professional Enhancement Award to support travel. **Annaliese Hettinger** received a grant from the PADI Project AWARE program ($2500) and $400 from CSUN Associated Students to support her research on the effects of wave energy on subtidal kelp forest communities. And **Graham Ferrier** received a grant from the PADI Foundation ($2500) to support a portion of his research on the relationship between algal morphotypes and hydrodynamic drag.

Rebecca Kordas pieced together funding from several sources—Associated Students, Graduate Office, College of Science and Math—to help cover the cost of nine months working on her Master's research in the Gulf of Maine. Rebecca works with Dr. **Steve Dudgeon**.

Amanda Izzo, a graduate student working with **Dr**. **David Gray**, received two grants: $1000 from the Orthopterists' Society and $1500 from the Anza-Borrego Foundation.

Dr. **Larry Allen** received a grant of $40,000 from the David and Lucille Packard Foundation to support publication costs for the upcoming book, *The Ecology of California Marine Fishes.* Drs. Allen, D. J. Pondella (Occidental College) and M. H. Horn (CSUF) are the editors of the volume. Dr. Allen also received $95,684 from the California Department of Fish and Game to continue a ten-year research program on the distribution of juvenile white seabass off the coast of southern California.

The Tropical Biology Program under the direction of Drs. **Fritz Hertel**, **Jennifer Matos** and **Paula Schiffman**, was awarded a $12,000 Instructionally Related Activity grant.

Dr. **Steve Oppenheimer** was awarded $144,343 for his cell adhesion research program from the National Institutes of Health, SCORE program.

Despite hard times with the state budget, several Biology faculty were awarded mini-grants from the University Research and Sponsored Projects Committee (Drs. **Steve Dudgeon**, **David Gray**, **Fritz Hertel**, and **Aïda Metzenberg**) and from the College of Science and Math (Drs. **Lisa Banner**, **Paul Wilson**, **David Gray**, **Peter Edmunds**, and **Robert Espinoza**).

Espinoza: Hollywood Consultant

Dr. **Robert Espinoza** was a consultant on a Paramount Pictures film: Lemony Snicket's *A Series of Unfortunate Events.* In exchange for his expertise, Paramount provided funds to bring in a distinguished herpetologist, Dr. Rick Shine, from Sidney, Australia, for a week to speak at Cal State Northridge and work with our students and faculty.

Faculty Speak Extramurally

Dr. **Janet Kübler** gave an invited seminar at the University of Maine. Dr. **Steve Dudgeon** gave an invited seminar at the University of Massachusetts, Amherst. Also to the U Mass audience, on another date, Dr. **Robert Espinoza** gave an invited seminar, which he repeated at the University of Connecticut on another invitation. Dr. Espinoza also will give an invited Plenary address to the Congreso Argentino Herpetología in San Juan, Argentina.

Biology Faculty, Students Honored

Dr. **Virginia Vandergon** was honored by the University as its 2004 recipient of the Visionary Community Service Learning Award. Specifically identified by the committee recommending the award was Vandergon's work with "Tomorrow's Scientists," an after-school program that brings middle school students to the University where they are guided in their activities by pre-service teachers enrolled in BIOL 102.

Undergrad **April Ochoa** was awarded second place for her talk at the Sigma Xi Research Competition: "Possible cannabinoid neuroprotection in the *spastic* Han-Wistar rat mediated by altered CB1 receptor expression."

In the CSU Student Research Competition in May, **Jacqueline Padilla-Gamiño** received the Runner-up Award in the graduate division.

At last May's awards ceremony, Biology Department awards were given to five students. The Outstanding Biology Student Award was shared by **Melissa Placke** and **Mandeep Sehmbey**. The Outstanding Biology Graduate Student Award went to **Geoffrey Horst**. The Bennett-Bickford Award for one who is going into teaching went to **Marissa Briones**. And the departmental Hugo and Irma Oppenheimer Award went to **Oliver Badali**.

At the level of the College of Science and Mathematics, **Casey Terhorst** won the Bianchi Graduate Student Award, and **Annette Angus** was named the College's

Heald Graduating Senior. **Melina Gregorian** won the College's Hugo and Irma Oppenheimer Award, and **Daniel Nelson** shared the Outstanding Junior Award with **Andrea Nemeth** of the Math Department.

NIH-sponsored Programs Offer Opportunities

Two minority-oriented programs—the Minority Access to Research Careers (MARC) and Minority Biomedical Research Support (MBRS)—are currently seeking student applicants. Both programs, sponsored and funded by the National Institutes of Health, are directed at improving the participation of historically under-represented people in the biomedical work force.

Says Dr. **Maria Elena Zavala**, program director, "The National Institutes of Health invests heavily in Cal State Northridge students, many of them from groups underrepresented in the biomedical sciences. Especially promising students are sponsored financially, but many aspects of the programs benefit all students."

Minority students who wish to become a research scientist are specifically encouraged to apply to one of the programs. Information is available in the MARC/MBRS office, Sc 2128, or on the web at *http://www.csun. edu/~csunmore/*. From the website, students can also access supplemental instructional materials for many classes by clicking on "gatekeeper courses."

Says Dr. Zavala, "All students, especially those within two years of graduation are invited to come to the office to look over the many paid summer internships available for science students. These summer research experiences are offered by numerous universities and research institutes throughout the US."

Productive Year for Our K-12 Teachers Programs

Two programs aimed at improving science teaching in California's schools received major funding this year. The Office of the President of the University of California awarded the California Science Project, co-directed by Drs. Steve Oppenheimer, Gerry Simila (Geology) and Virginia Vandergon, an additional $188,889. The sister ITQ (Improving Teacher Quality) program received $99,090 from the California Postsecondary Education Commission's federal grant program to provide research experiences for participating teachers. Dr. Oppenheimer directs the research track of the ITQ program; its workshop track is guided by Drs. Simila and Vandergon.

According to Dr. Oppenheimer, "The Science Institute this year focused on science standards for grades 4 through 7." The goal was to familiarize teachers both with science content standards established by the state, and to prepare them to assist their colleagues in teaching science.

Teachers attending the institute had daily lectures on science fundamentals, participated in hands-on lab activities and took a field trip to the Santa Monica Mountains. All activities included lessons in the physical, Earth and life sciences.

A culminating activity for the teacher participants was the conduct of a set of experiments of their own design. Using Fastplants, the teachers identified and tested a hypothesis of their choosing, then presented their study to the group in poster form. According to Dr. Vandergon, "After doing this project the teachers agreed they had developed a better understanding of the scientific method and the use of controls."

Working with Drs. Vandergon, Oppenheimer and Simila to design and implement the lessons were Drs. **Cathy Coyle-Thompson** (Biology), **Elizabeth Nagy** (Geology), **Norm Herr** (Sec. Education), and **David Kretschmer** (Elem. Education).

Four teachers also learned the ins and outs of science during a summer workshop in Dr. **Michael Summers**' lab. There the teachers designed microbiological experiments intended to reinforcing broad biological principles covered in the K-12 curriculum. During the current school year, students in the teachers' classes will repeat the experiments, learning in the process how science works. The workshop, supported by an NSF grant to Dr. Summers, will be repeated next summer. Interested life science

A Sampler of Spring Courses

Spend spring in the Desert! **Biology of Deserts** (BIOL 426) will be taught by Dr. David Gray. Lectures will cover adaptations of plants and animals to desert life, and the biogeography and natural history of the deserts of southwestern North America. Three weekend field trips (Friday-Sunday) will explore nearby desert areas, and a 8-day extended fieldtrip over **spring break** will introduce students to the incredible beauty and variety of life in the Sonoran Desert of Arizona. The course fulfills the Biology field requirement and is in the Ecology and Environmental Biology selective program. Although listed as meeting every Friday, it will in fact meet only on four Fridays in advance of the scheduled field trips. For more info, see *www.csun.edu/~dgray/teaching.html*.

Field Ecology (BIOL 423) will be offered on **Saturdays**. This course visits many of southern California's diverse biomes. Most weeks the students do a "mock" research project, so that ecology is taught by example. The examples are drawn from a wide range of topics in ecology. Dr. Paul Wilson is the instructor.

Entomology (BIOL 513), the study of insects, will be offered in spring by Dr. David Gray. Topics include morphology, physiology, behavior, ecological and evolutionary relationships. The course fulfills the Biology field requirement and falls within the Systematics and Comparative Biology selective program. For more course information, see *www.csun.edu/~dgray/teaching.html*.

The **graduate seminars** scheduled for the spring are: "Parasitology of fishes" with Dr. Cheryl Hogue (Thursday, 2-5); "Biological implications of temperature" with Dr. Robert Espinoza (Wed., 5-8); and "Emerging viral diseases" with Dr. Lisa Banner (Tuesday, 2-5).

New Edition of Cancer Book

Cancer, A Biological and Clinical Introduction with Cancer Prevention Guide by Dr. Steve Oppenheimer was released in August by Pearson Education. The book includes a new 50 pages "Cancer Prevention Guide" as well as updating the science and references of previous editions.

The book assumes no particular background in science, and introduces a large amount of cell biology in the context of explaining cancer. Sections are short, readable, and often illustrated with simple diagrams. Our popular general-education course Biology of Cancer uses this highly digestible text. Dr. Oppenheimer's commentary gives a taste of his writing and politics.

teachers can contact Dr. Summers at *michael.l.summers@csun.edu*.

In May, about 100 K-12 students presented posters at Cal State Northridge, a part of the ITQ Student Research Symposium. Many of the students had abstracts of their work published in the *Journal of Student Research Abstracts*, which summarized the research efforts of over 700 K-12 students from the classes of about 40 teachers. Says Dr. Oppenheimer, journal editor,"The journal is disseminated worldwide, and has been used by teachers and students as far away as Casablanca."

The Light Side of Gray Literature: Value as Social Commentary?

Dr. **Steve Dudgeon** co-authored a paper entitled, "The Morphology of Steve" in the *Annals of Improbable Research* (along with 284 other Steves including Steven Hawking, and a few Nobel laureates named Steve, plus the directors of the National Center for Science Education).

Project Steve began as a parody of the creationist practice of compiling lists of "scientists who doubt Darwinism" (many of them being misquoted). The Center drafted a statement about the importance of evolution and collected signatures of scientists named Steve in honor of evolu-

Commentary: Diet's natural carcinogens versus man-made carcinogens.

—Steve Oppenheimer

Our environment is full of man-made carcinogens, but few realize that our diet is also loaded with natural carcinogens. Black pepper, for example, contains small amounts of safrole and piperine; mushrooms contain hydrazines; celery, parsnips, figs and parsley contain psoralen derivatives; chocolate and tea contain theobromine; allyl isothiocyanate is in horseradish and mustard oil; and raw cottonseed oil contains gossypol. All the chemicals listed have been implicated in causing cancer, at least in culture.

Alcohol is associated with cancers of the mouth, esophagus, pharynx, larynx and liver. Some molds that grow on grains, nuts, bread, cheese, fruit and apple juice produce major carcinogens, aflatoxin and sterigmatocystin. High fat consumption may be associated with some cancers, and burnt foods contain some of the same combustion products found in cigarette smoke.

Although fruits and vegetables contain many anti-cancer compounds, such as vitamins A, E, and C, and beta carotene, beets, celery, lettuce, spinach, radish and rhubarb may contain nitrates and nitrites that can be converted in the body into carcinogenic nitrosamines. Indeed, some estimates suggest that our food contains 10,000 times more natural toxins than it does man-made toxins such as pesticides.

A major natural carcinogen cited by the Environmental Protection Agency as the most dangerous naturally occurring health hazard of all time is radon, a radioactive gas that comes from the ground and concentrates in homes. Radon is odorless and colorless, and can pose a major cancer risk. It is impossible to know if a home contains dangerous levels of radon without testing for it.

Millions of workers are exposed to industrial carcinogens such as 4-aminobiphenyl, arsenic compounds, asbestos, auramine, benzene, benzidine, bis (chloromethyl) ether, hematite, nickel, vinyl chloride, magenta, carbon tetrachloride, acrylonitrile, beryllium, 2-napthylamine, soots, tars, and oils. Some of the beautiful pigments for artists' paints contain cadmium, chromium and nickel compounds, all likely potent carcinogens.

Most municipal water supplies contain low levels of many man-made probable carcinogens, such as those associated with the process of chlorination. Air pollution also accounts for our exposure to many man-made carcinogens. Even some drugs and medicines are possible carcinogens, among them coal tar ointments, phenacetin, chloramphenicol, oxymetholone, melphalan and cyclophosphamide, lindane, and Flagyl. Some hair dyes contain carcinogens, but unlike drugs cosmetics are not strongly regulated by the government.

So what is my take-home lesson? Both man-made and dietary carcinogens greatly contribute to cancer risk. The single most important cause of death by cancer in the U.S. is cigarette smoke, but more and more evidence suggests that the foods we eat and the environment we live in are rich in carcinogens. The more we know about them, the better chance we have of controlling our risk of developing cancer.

In 1775 the British physician Percivall Pott started the field of cancer prevention by noting that cancer risk can be lowered by reducing exposure to carcinogens. The same is true today. And we can, through our votes, demand better safeguards to protect our air, water, foods and consumer products. All homes on the market should be tested for radon before sale. Radon levels are easily reduced in homes, but we must legislate required testing. Before a home is sold, a test for termites is required. We need to do the same for radon. I don't know of a termite that ever killed anyone, but radon is deadly. Houses must be tested for it. Finally, the tax on cigarettes should be substantially increased to reduce smoking.

tionist Stephen Jay Gould who recently passed away.

For joining Project Steve, the Center mailed T-shirts to signatories and used their shirt sizes and zip codes as a database, the basis for the so-called analysis. The tongue-in-cheek project was clearly intended as a commentary on the "methodology" of creationists.

Pre-dental News

This year's Pre-Dental Club was organized at a September 7 meeting. After a hotly contested campaign replete with speeches proposing activities, elections for officers were held.

The club's probable activities include talks by local dentists and dental school students, trips to dental schools, and visits by representatives from dental schools and programs related to dentistry.

Students interested in the club should contact **Hesam Hekmatjou**, the newly elected president at *voroojak@juno.com*.

Pre-dental advisement by Dr. **Mary Corcoran** continues on Wednesdays, 10:00 to noon, in Science 3216B. Drop by to have questions answered or to get forms; no appointment is needed. Or, leave a message at 677-3348 to arrange another time or day.

Students Earn Biology Honors

Last year, two students—**Elon Hartman** and **Marisa Briones**—earned Honors in Biology. Among other requirements, students in the Honors program must complete a research project and write a senior thesis.

Elon worked with Dr. Rheem Medh studying the role of genes in apoptosis (cell death) of lymphoid cells. In November Elon presented his work at the Southern California Conference on Undergraduate Research at UC Irvine. Marisa did her honors thesis on a rare genetic disease, dyskeratosis congenita, in Dr. Aïda Metzenberg's lab. This lethal X-linked condition is not completely understood, and the mutations responsible are still being defined. Marisa was a MARC student. Both Elon and Marisa are now enrolled in Ph.D. programs at UCLA.

"The Biology Honors Program is a great way for undergrads to gain research experience that will enhance their academic careers and better prepare them for graduate and professional school," says Dr. Cheryl Hogue, director of the Biology Honors Program. Honors students have a special notation on their transcripts, are honored at the Department honors ceremony before commencement, and receive a special certificate. Acceptance to the program requires completion of 90 units, a G.P.A. of 3.5 in the major and overall, and a faculty sponsor. Contact Dr. Hogue at *cheryl.hogue@csun.edu* or 677-3349.

New Master's Students

Nineteen new master's students have signed up for apprenticeships with Biology faculty. **Mairead "Mai" Maheigan** from U Mass Amherst has started work in Dr. Edmunds' lab. **Christiana Boerger** from the University of Hawaii Hilo and **Chris Chabot** from California State Polytechnic University Pomona are entering Dr. Allen's lab. Our own **Raymond Burke** is entering the lab of Dr. Sparling. **Taya Cummins** from San Luis Obispo is to work with Dr. Schiffman. **Orlando Garcia** from University of Colorado and **Fumiko Yamamoto** from Fresno Pacific University have come to work with Dr. Aïda Metzenberg. **Adrian Giovannone** from Loyola Marymount University, **Angila Sewal** from UCLA, and **Randall Kenien** from Pepperdine are to work with Dr. Oppenheimer. **Shehzaana Kureshi** from UCSB will be in Dr. Banner's lab. **Julia Martin** and **Mari Mazidzhyan**, both from CSUN, will enter Dr. Baresi's lab. **Rebecca Miller** of Cal State San Jose is to work with Dr. Vandergon. Our own **Nikki Osborn** will continue her work with Dr. Gray. **Ronak Patel** from Sardar Patel University (India) will be working with Dr. Summers. Our **Don Reeder** will work with Dr. Cohen. Dr. Carpenter's lab welcomes the arrival of **Stephanie Talmage** from Cornell University and an alumna of their Tropical Marine Science program in Akumal, Mexico. **Tarja Sagar** will be working with Dr. Wilson, and unlike the others has entered the program in Interdisciplinary Studies with an emphasis in Ecology.

Biology Alumni Tidbits

In addition to Elon and Marisa, mentioned in an earlier article, several other students are going on for doctoral work. Four more MARC or MBRS students have been accepted into Ph.D. programs: **Claudia Toledo** and **Raquel Martinez** to USC, and **Keri Silva** and **Annette Angus** to U.C. Berkeley. Annette, who worked on oto-palato-digital syndrome in Dr. Aïda Metzenberg's lab, was pleasantly surprised when, while working on the very rare disorder, the gene responsible was identified by another research group. As a consequence, Annette and Dr. Aïda Metzenberg were able to collaborate with them.

Geoffrey Horst, who did his grad research with Dr. **Peter Edmunds**, has started a Ph.D. program at Michigan State University.

Former grad student **Jamie Kneitel** (M.S. 1997 with Dr. Schiffman) was recently hired as a faculty member in the Department of Biological Sciences at CSU Sacramento, where he has started by teaching courses in ecology and biostatistics. After earning his Ph.D. at Florida State University Jamie was a post-doc at Washington University in St. Louis.

Former MARC student **Jeanette Ducut-Sigala** had her Ph.D. work published in *Science*. Jeanette earned her Ph.D. from UC San Diego.

Former grad student **Rebecca Habeeb** (M.S. 2001 with Dr. Edmunds) was recently recognized with the prestigious Ron Kenny Award issued by the Australian Marine Science Association for research excellence. Rebecca is well into her doctoral study of the dynamics of subtidal marine communities at the University of Tasmania.