

Bios

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California State University
Northridge

California State University, Northridge

Publications by Biology Faculty and their Students

Since the last *Bios*, the work of many students and faculty has seen the printed page*.

Dr. **Stan Metzberg** and his former students **Bernadette Jean-Joseph** and **Ariadna Martinez** published their research on "The U5/U6 snRNA genomic repeat of *Taenia solium*" in the *Journal of Parasitology*. The paper was featured in the cover art for the issue.

Former students **Cheryl Baca Hovey**, **Tim Hovey**, and Dr. **Larry Allen** have published "The reproductive pattern of barred sand bass (*Paralabrax nebulifer*) from southern California" in *California Co-operative Fisheries Investigations*. Also from the fish lab, graduate students **Mia Adreani** and **Brad Erisman**, along with Bob Warner of UC Santa Barbara, have published "Observations of courtship and spawning behavior in the California sheephead, *Semicossyphus pulcher*" in *Environmental Biology of Fishes*.

A paper from Dr. **Randy Cohen's** lab has been accepted for publication in *Nicotine & Tobacco Research*. "Characterization of chronic nicotine exposure on the survival of the Spastic Han-Wistar rat," is co-authored by former students **Junie Hildebrandt**, **Delilah Toledo**, and **Jennifer (Termeer) Spear**.

Dr. **Peter Edmunds** is author of a recent paper in *Coral Reefs*, "Long-term dynamics of coral reefs in St. John, U.S. Virgin Islands." The journal *Bioscience* has accepted a forum article by Dr. Edmunds and Dr. **Ruth Gates**, a Senior Research Scientist in the Biology Department. The paper is titled "Has coral bleaching delayed our understanding of fundamental aspects of coral-dinoflagellate symbioses?"

Forthcoming in the *Bulletin of the*

Southern California Academy of Sciences is a paper by student **Jonelle Saily** and Dr. **Dave Gray**, "Acoustic behavior of *Hoplosphyrum boreale* (Scudder): A common scaly cricket of southern California."

A paper based on **Sandra Ng's** Master's thesis is scheduled to appear in *Biological Conservation*. The paper, entitled "Use of highway undercrossings by wildlife in southern California," is co-authored by her mentor, Dr. **Jim Dole**, and Drs. **Ray Sauvajot** (Biology Adjunct professor) and Seth Riley of the Santa Monica Mountains National Recreation Area, and Dr. **Tom Valone**, a former Northridge professor now at St. Louis University.

Drs. **Shannon Lee**, **Ruth Gates**, and UCLA's David Jacobs have a paper in the *Journal of Molecular Evolution*, "Gene fishing: The use of a simple protocol to isolate multiple homeodomain classes from diverse invertebrate taxa."

In the newly published *Encyclopedia of Insects*, Dr. **Jim Hogue** authored two entries: "Cultural entomology" and "Folk beliefs and superstitions."

Dr. **Steve Dudgeon** published a paper, co-authored with Drs. Peter Petraitis and Erika Carlson Rhile of the University of Pennsylvania, in *Journal of Experimental Marine Biology and Ecology*. The work is titled "Survivorship of juvenile barnacles and mussels: Spatial dependence and the origin of alternative communities."

Bumper Crop of Research Presentations at National and International Meetings

Cal State Northridge was well represented at the Benthic Ecology meeting, with several students giving papers. **Casey Terhorst** presented a poster entitled, "Alternative stable states and fouling community structure." The poster was identified as the best poster presented by a student. **Janna Fierst** had a poster entitled, "Morphological differences in the red alga,

Mastocarpus papillatus." **Kylla Benes's** poster was, "Gastrovascular transport and the regulation of growth and morphogenesis in hydrozoans." **Laurie Requa's** poster was titled "Coral recruitment in the Virgin Islands: Preliminary results and implications for a source-sink model." **Geoff Horst** presented his work on "The effects of aragonite saturation state on the calcification rate of juvenile corals of *Porites astreoides*: a proposal for research." Faculty mentors of the students are Drs. Steve Dudgeon (Casey, Janna and Kylla) and Peter Edmunds (Laurie and Geoff).

Graduate student **Amanda Izzo** and Dr. **Dave Gray** presented a poster at the Animal Behavior meeting: "Songs, speciation and sympatry in two species of field crickets, *Gryllus rubens* and *Gryllus texensis*." Dr. Gray also gave a solo poster at the Animal Behavior meeting on "Courtship as a reproductive isolating mechanism in crickets."

Students in Dr. **Steve Oppenheimer's** lab had an ebullient showing at the Experimental Biology meeting where they presented three papers; Dr. Oppenheimer was a co-author on all: •**Maria Khurrun**, **Oliver Badali**, **David Khatabi**, **Marcela Barajas**, teacher **Greg Zem**, "Bead analysis of human colon cancer cell surfaces." •**Marcela Barajas**, **Sahar Sajadi**, **Victor Estrada**, "Sugar effects on sea urchin gastrulation." •**Lyla Ngo**, **Marcela Barajas**, **Gayani Weerasinghe**, teacher **Greg Zem**, "Studying sperm cell surfaces with derivatized beads."

Many students and faculty presented at the meeting of the Society of Ichthyologists and Herpetologists in Manaus, Brazil. Student travel to the meeting was supported by the Department and the Office of Graduate Studies.

Students from Dr. **Larry Allen's** lab who gave papers at the Brazil meeting were: •**Mia Adreani**, "Observations of courtship and spawning behavior in the California sheephead, *Semicossyphus*

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

pulcher"; •**Brad Erisman**, "Spawning behavior of the kelp bass, *Paralabrax clathratus*, from Santa Catalina Island, California"; •**John Froeschke**, "A comparison of reef fish assemblages between Santa Catalina Island and the Los Angeles breakwall"; •**Eric Miller**, "Captive spawning behavior of the spotted sand bass (*Paralabrax maculatofasciatus*)" and "Initial protocols for the captive breeding of spotted sand bass (*Paralabrax maculatofasciatus*) in southern California"; •**Josh Lindsay**, "Temporal patterns in the settlement of cryptic reef fish"; and •**Matt Salomon**, "Gene flow among populations of spotted sand bass, *Paralabrax maculatofasciatus*, within the Southern California Bight."

Also presenting at the Brazil meeting was Dr. **Robert Espinoza** with a paper on "Herbivory imposes constraints on the life-history strategies of reptiles." In addition, his student, **Kamelia Fallahpour**, offered her work on "Male persistence and female rejection: Breeding coloration in leopard lizards, *Gambelia wislizenii*."

Dr. **Jennifer Matos**' contribution at the Brazil conference was entitled "Phylogenetic relationships and biogeography of the Louisiana pine snake (*Pituophis ruthveni*)."

Dr. **Wendy Birky** gave a paper at the meeting of the American Association of Physical Anthropologists on the topic of "First line defense: Male dominance rank and aggression toward extra-troop males in a wild group of Formosan macaques (*Macaca cyclopis*)."

At the European Phycological Congress, Dr. **Janet Kübler** spoke on "The role of fertilization success in the ecology and evolution of algal life histories," and Dr. **Steve Dudgeon** presented his work on "Alternative stable states on rocky intertidal shores." Two weeks later, Dr. Dudgeon went to Reykjavik, Iceland, to the investigators' meeting of the Coordinated Research on the North Atlantic project where he gave an invited talk, "Combining phylogeographic and ecological studies in comparisons of Pacific and Atlantic seaweeds."

Farnaz Hassid, a student of Dr. Stan Metzenberg, presented her thesis work on "Mutability of the HIV reverse transcriptase" at the International Conference on Antimicrobial Agents and Chemotherapy. **Cheryl Cina**, a Genetic Counseling student also working with Dr. Metzenberg, is

presenting her Genetic Counseling thesis at the National Society of Genetic Counselors.

At the Experimental Biology meeting, Dr. Randy Cohen's students **Don Reeder**, **Thiago Halmer** and **Vernita Davis** presented a poster on "The role of nitric oxide in intracellular mechanisms of epileptogenesis."

In August, Dr. **Cheryl Hogue** presented a poster on "Metazoan parasites of Pacific sanddab from Santa Monica Bay" at the American Society of Parasitologists meeting held in Halifax, Nova Scotia.

Dr. **Paul Tomasek** and his graduate student, **Fabricio Rojas**, presented a poster at the American Society for Microbiology's 103rd General Meeting, in Washington, DC. The poster was entitled "Characterization of the carbofuran hydrolase promoter in *Achromobacter* sp. strain WM111."

Student **Gabriele Meyer** and her mentor Dr. **Gini Vandergon** presented a poster at the Society for the Study of Evolution meetings in Chico, California, in June. The paper, "The loss of the *accD* gene in monocot evolution," was based on Gabriele's honors thesis.

Students Honored, Funded

Each year the Biology faculty recognize the best and the brightest among students completing their studies. For 2003, **Gabriele Meyer** was named Outstanding Biology Student and **Jolene Pucci** received the Bennett-Bickford award as the top student entering a teaching profession. Biology's Outstanding Graduate Student Award was shared by **Brad Erisman** and **Christina Hwang**.

Biology's Hugo and Irma Oppenheimer Award for Excellence in Research and Teaching Promise went to **Oliver Badali**; an award of the same name given by the College of Science and Mathematics also went to a Biology student, **Maria Khurum**. Both Oppenheimer awards honor students whose original research has led to publication and who show promise as teachers at the college or pre-college levels. Maria and Oliver co-authored several research papers.

Also recognized with awards from the College of Science and Mathematics was **Thiago Halmer**, who won both the College's Outstanding Junior Award and the Heald Outstanding Junior Award. Biolo-

gy graduating senior **Sanam Soroudi** was the Biology Department's nominee for the Heald Graduating Senior Award.

Christina Bañuelos Miramontez, a student employee in the Vivarium, was named the University's "Work-Study Student Employee of the Year." Christina was honored at a luncheon in April.

Diane Andres received a pre-doctoral fellowship from the CSU for \$3000, a \$500 grant from the American Society of Ichthyologists and Herpetologists, and \$1150 from the Southern California Academy of Sciences. **Jennifer Weist**'s research has been funded by \$500 from the American Society of Ichthyologists and Herpetologists and another \$500 from Sigma Xi Scientific Society. Both Diane and Jennifer work with Dr. Robert Espinoza.

The CSUN Student Projects Committee is providing support to **Laurie Requa** and to **Geoff Horst**, students of Dr. Peter Edmunds, for their studies on coral ecophysiology. _____

Faculty Bring Home Dough

Dr. Larry Allen received \$145,703 from the California Department of Fish and Game to continue research on the distribution of juvenile white sea bass off the coast of southern California.

Dr. Steve Oppenheimer was awarded a research grant of \$288,686 from the National Institutes of Health SCORE program for his work on "Mechanisms of adhesive interactions."

The Eisenhower Program Postsecondary Education Commission has awarded an additional \$42,000 to Drs. **Steve Oppenheimer**, **Virginia Vandergon**, **Gerry Simila** (Geology), **Norm Herr** (Secondary Education) and **Reseda High School** teacher **Tony Recalde**. The funds are to provide additional stipends for teachers to participate in research experiences and leadership workshops.

Drs. **Peter Edmunds** and **Robert Carpenter** received \$20,000 from the National Geographic Society to fund a followup study of work they reported earlier in the *Proceedings of the National Academy of Sciences*. Their project, entitled "Effects of sea urchin recovery on Caribbean coral reefs," is an analysis of sea urchin status on islands stretching from Belize to Venezuela.

Dr. Paul Tomasek recently received

\$16,000 from CSUPERB's (CSU Program for Education & Research in Biotechnology) Entrepreneurial Joint Venture Matching Grant Program. He, Dr. Frank Butterworth of Biomonitoring Technologies, Inc., and graduate student **Jedi Lobos**, will use the funds to support their study on "Development of a bioelectrode to rapidly detect pathogenic *Bacillus cereus* and *Bacillus anthracis*."

The University named eleven Biology faculty as recipients of this year's research support. Drs. **Lisa Banner, Robert Carpenter, Randy Cohen, Peter Edmunds, David Gray, Fritz Hertel, Cheryl Hogue, Rheem Medh, Aida Metzenberg, Virginia Vandergon and Paul Wilson** each will receive approximately \$5,000 in research funds or the equivalent in reassigned time.

The College of Science and Math has set aside funds to support the research of Drs. **Robert Espinoza** and **Steve Dudgeon**. Each will receive about \$5,000.

Faculty Speak Extramurally

Dr. **David Gray** presented his research at UC Riverside: "Mating behavior and reproductive isolation in field crickets" on April 18, 2003.

Dr. **Paul Wilson** spoke at the University of Toronto, Humboldt State University, and the Rancho Santa Ana Botanical Gardens on various projects being done with his students involving penstemon pollination.

Dr. **Robert Espinoza** gave a talk to a gathering of physiological ecologists at the White Mountain Research Station: "Why herbivory shouldn't evolve in reptiles and a hypothesis for why it does." Dr. Espinoza also gave an informal presentation at College of the Canyons on "Planning for a Career in Science at an Academic Institution."

Northridge Biologist is Leader in K-12 Education

Dr. **Stan Metzenberg** has been appointed to a four-year term on the California Curriculum Development and Supplemental Materials Commission. The principal activities of the Commission, an advisory body to the State Board of Education, is to review instructional materials for statewide adoption, and to help formulate educational policies related to curriculum and instruction.

At a five-day meeting in St. Louis, Dr. Metzenberg served as a science and mathematics content reviewer for a national test under development by the American Board for the Certification of Teacher Excellence (ABCTE). The ABCTE is charged with developing high quality teacher credentials based on valid and reliable measures of a teacher's knowledge of both course content and pedagogy. At the St. Louis meeting quantitative performance levels on nationally recognized examinations were established. According to Dr. Metzenberg, "The ABCTE examination holds promise as an alternative route for the certification of highly qualified teachers, and is cited in the federal *No Child Left Behind Act* as a premiere doorway to the teaching profession."

Dr. Metzenberg also was appointed to the Content Review Panel for the California Alternative Performance Assessment (CAPA), a California standards-based test administered to children with disabilities unable to participate in general statewide assessment programs. He and Dr. **Aida Metzenberg**, Director of the Cal State Northridge Genetic Counseling Program, continue to serve on the Science Content Review Panel for the California STAR program, developing end-of-course assessments for high school students.

Spring Semester Courses

In a team-taught graduate level Evolution course (BIOL 615B) this spring, lectures by several professors will alternate with discussions of thought-provoking papers. The class will meet Wednesday evenings.

Dr. **Robert Carpenter** will be teaching a graduate seminar on "Physical Biology in Marine Environments" (BIOL 615C). The class will meet on Tuesday nights.

Bioinformatics (BIOL 503, formerly 595E) will be on M/W evenings. The goal of the course is to learn how to analyze protein, DNA, and RNA sequence data. For more information contact Dr. **Virginia Vandergon** at virginia.vandergon@csun.edu.

In spring, Dr. **Paul Wilson** will be offering **Field Ecology** (BIOL 423) on Saturdays. "We go to rocky shore, sandy shore, riparian habitat, grassland, coastal sage scrub, chaparral, montane forest, and even the desert," says Dr. Wilson, "and in most of them we do something approach-

ing a research project."

If bugs bug you (or even if they don't) consider taking **Entomology** (BIOL 513) this spring. According to Dr. Dave Gray, class instructor, "We do lots of work outside and over the course of the semester students really transition from an 'oh, gross bugs' response to a 'hey that's cool mentality.'" The course meets the field studies requirement of the B.A. degree.

Interested in the green leafy organisms that surround us and serve as the ecological foundation for terrestrial life? Get clued in by enrolling in **Plant Ecology** (BIOL 407/407L/492N). The course, to be taught again by Dr. Paula Schiffman, will focus on plants and vegetation from an ecological and evolutionary perspective. Local southern California species and ecosystems will receive special emphasis.

Students interested in **Microbiology** should be aware that for the foreseeable future **Bacterial Diversity** (Biol 418/L) will be offered each spring, while **Microbial Physiology** (Biol 417/L) and **Microbial Ecology** (Biol 419/L/492C) will be offered in fall. Plan accordingly.

Faculty Invite Students To Work in Their Labs

According to Dr. **Larry Allen**, the Nearshore Marine Fish Research Program needs field help. The program has several large contracts, each of which requires student help. Says Dr. Allen, "Students working on these projects have an opportunity to gain invaluable research experience in field work." Interested students, graduate or undergraduate, should contact Dr. Allen (x3340) or **Josh Lindsay** (x4037) in the fish lab (Sci 4112).

Dr. **Steve Oppenheimer** (Sc. 2005 or steven.oppenheimer@csun.edu) is always looking for students who want to do research with him. Dr. Oppenheimer studies human cancer cells and sea urchin embryos. Though most students receive academic credit for their work, a few experienced assistants will be paid with funds from a new NIH grant. Applicants for paid positions must have experience with sea urchins, column chromatography, affinity chromatography, glycobiology, gel electrophoresis, or confocal microscopy.

Dr. **Cheryl Hogue** seeks a student to assist with a study on the effects of parasitism on mate choice in fish. Contact her at 677-3349 or cheryl.hogue@csun.edu.

The Students' Forum

Bios invites articles written by students about their biological experiences. Interested students are encouraged to consult with the editor or publisher regarding their ideas.

About the student authors: Last spring, Drs. Paula Schiffman, Jennifer Matos, and Fritz Hertel taught the Tropical Biology Semester, a set of linked courses on tropical ecology, botany, and vertebrates. Graduate students **Ray Hernandez** and **Kamelia Fallahpour** were in that program, though at the time Ray was a senior. **Omar Escamilla** is a former MARC/RISE student; now a graduate student in Health Science he does research with Dr. Lisa Banner.

Tracking a Ctenosaur

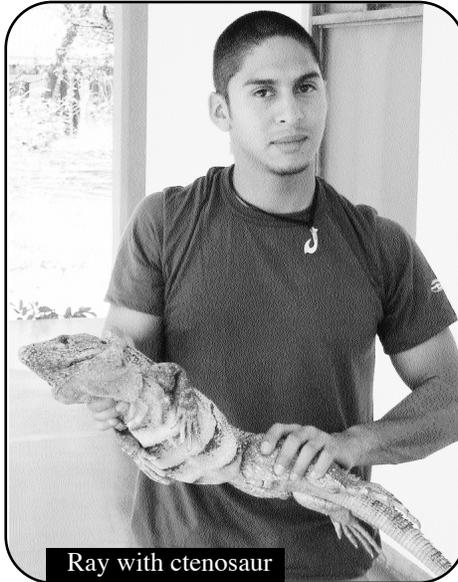
— by Ray Hernandez

It's been said that the best way to learn a language is to immerse yourself in it, living amongst those who speak the language. The same is true of field biology. Every day in Costa Rica I awoke in nature with no outlets—no television, no computers, no job. The whole semester I was surrounded by field biologists. In Costa Rica, I was surrounded by the wild and the wonderful.

A major goal of the trip was to design and complete three experiments. At first, coming up with an idea was hard, perhaps because I had to learn my new environment: First I had to notice patterns, open my eyes, and see the questions that were just waiting to be asked. Once I started to develop hypotheses everything else followed naturally. It then became problem solving; how to design an experiment to get the data to answer the question I posed?

My most memorable research attempt was one that allowed me to catch and handle a three-foot long lizard named *Ctenosaura similis*. We saw ctenosaurs everywhere in the drylands of Guanacaste, and being an aspiring herpetologist I felt compelled to catch at least one. The problem was coming up with a justification to validate my desire. I thought of multiple ideas to test, but none seemed like valid reasons to handle these lizards.

Finally, on the way to another study I noticed a ctenosaur eating dry fruit, one after another. My moment had come! I decided to see if ctenosaurs are seed



Ray with ctenosaur

predators or seed dispersers. Since reptiles don't get much credit for aiding in the dispersal of seeds, this study might be of importance in terms of understanding the role of reptiles in ecological communities.

I had it all planned out. I would noose the lizards which, as a defense mechanism, I expected would defecate. I'd then study their feces to see if live seeds had passed through. Needless to say I was given some pretty foul nicknames for a while.

To begin the experiment I had to actually capture a lizard. Boy, was this fun! Ctenosaurs are big and quick, and they don't like being approached. I spent hours trying to get close enough to noose one, often getting within a couple feet before it ran off. It didn't help that the temperature was 95° F, and there was no shade anywhere.

After countless attempts, Dr. Hertel and fellow student Michael Brewer took pity on me and offered to help with my reptilian round up. Approaching a ctenosaur from different directions, two of us distracted it while the other tried to noose it. After many tries, Michael got one! I grabbed it and started wrestling the lizard while it thrashed its huge, spiny tail left and right, then did a "death roll" as alligators are known to do. We had only a few moments to get the beast under control since the spines quickly frayed the noose. Working together, we eventually managed to secure its body long enough to collect a fecal sample, measure limb lengths, weigh it, and pose for photos.

I'd done it! I'd caught and held a

ctenosaur, one of two goals I'd set for myself. Unfortunately, an unexpected illness (due to a scorpion sting while performing a study at night) prevented me from capturing more ctenosaurs. This didn't totally end the study though because I found six dry fecal samples. The data from these samples suggested that ctenosaurs can act as seed dispersers, though not particularly good ones when compared to birds and mammals. I ended up developing other projects for my papers, projects that were more rigorous scientifically, but the ctenosaur experience is the one that in some non-scientific way I loved the most.

The tropical biology semester was perhaps the greatest experience of my academic career (so far). I learned more about field biology and experimental design in that semester than I have in years of on-campus classwork.

Diving for Frogs

— by Kamelia Fallahpour

The trip to Costa Rica was an incredible experience. The rainforests were covered with shrubs and trees dense with foliage: Climbing lianas dangled from branches, and mosses and bromeliads covered tree trunks.

One of my favorite places was the La Selva Biological Station. It was the wettest and most species-rich place we visited. Each trail ran through a different type of environment, some through swamps, others through primary forests, still others through fields. One of the most amazing animals I saw at La Selva was an eyelash viper (*Bothriechis schlegelii*) coiled up on a branch two feet off the ground. The bright yellow, deadly snake stayed within arm's length at the side of a trail for days.

At La Selva, I did an experiment on the strawberry poison-dart frog (*Dendrobates pumilio*). I compared the frog's colors and dimensions in different locations. Coloration and pattern of strawberry poison-dart frogs vary from red to yellow to green to orange to blue, and even black and white, depending on the population. The color morph found at La Selva is a brilliant red, with blue hind limbs and pale blue patterning on the abdomen—very classy!

The frogs were highly abundant, diurnal, and easily located by their bright color and loud chirping, so I managed to collect 42 from three sites in just a few days. Catching the frogs was amusing. I would begin by walking a trail listening for loud chirps,

which would often to my surprise turn out to be the call of a cricket. Closing in on a frog, I examined the thick leaf litter and searched tree stumps and logs until I saw a tiny red speck, usually a male, calling. Sometimes I would also find a female within a few inches of the male. I'd then make a dive for the frog, sticking my hand in what I hoped was only leaf litter and not a burrow of another living organism. Many got away, but after hours of 'diving for frogs' I managed to collect enough of them. I collected data on each of them to determine if the exuberant variation was a manifestation of several races mixing at La Selva. A little multivariate statistics once we got home made me think that this explanation is unlikely.

The tropics have a riot of environments. In addition to the wet foothill habitats of La Selva, we worked at Monteverde, a cloud forest, where we saw a pair of Quetzals, birds prized by the Aztecs and Mayans for their long bright green and scarlet feathers. We traveled higher in elevation to Cerro de la Muerte, an alpine cloud forest with vegetation whose physiogamy could have been in the temperate zone. At the other extreme was Santa Rosa National Park, a lowland dry forest, where frogs visited our sinks and geckos clambered along the walls of our rooms. And everywhere there were huge roaches, about four inches long, that kept getting caught in our mammal traps.

I found the tropics full of surprises. In a two-minute walk from the cabins to the kitchen, we might see a snake, a few lizards, a handful of birds, and maybe a tapir. Not uncommonly, a hot, humid afternoon unexpectedly turned into a powerful thunderstorm with a torrential downpour. We quickly learned to always be prepared with an umbrella!

As a field biologist, what I gained most from this program was an awareness of new environments. Throughout the program I was constantly pressed to ask new questions about the organisms I saw, and to test, on short notice, my predictions

about them. The courses allowed me to explore and learn with hands-on experience. The professors of the course, Fritz Hertel, Jennifer Matos, and Polly Schiffman, worked hard to make the course interesting, always made themselves available to us, and helped us improve our projects. The Costa Rica program was the most life-changing semester of my college career!

Lost and Found in Thailand

— by Omar Escamilla

This past summer I had a unique opportunity to visit Thailand where I helped with research on factors that affect the environment, occupational health, and on public health issues. The Thai government does not have agencies such as EPA and OSHA to protect the environment and workers. But Thai people commonly join together to implement regulations to improve their quality of life. My research assignment was to collect data related to several health-related issues, including how smoking affects health. In this role I interacted greatly with the Thai people and in the process I came to better understand and to admire their way of life. As a consequence of my experience, I grew professionally, intellectually, and personally. It is the latter that I value most.

When I received the call from Dr. Maria-Elena Zavala that I had been selected to participate in CSU, Fullerton's MIRT-Thailand Public Health Program, little did I know how the experience would change my life. As a Mexican-American/Chicano living in California I am categorized as a "minority" and have certainly experienced my share of social discrimination. Before my summer experience this fact greatly influenced how I saw myself and the world. But while living at the International Center of Thailand's Chiang Mai University, a hostel that caters to international students and staff, I experienced multiple

cultures and made friends from many parts of the world. All were whites, but they did not look at me as a minority. Instead, they accepted me for who I am and judged my personality.

But, my attitude was affected by other events as well. When sent to rural village hospitals I was hosted by genuinely warm individuals who made me feel at home: They gave me their best. The warm smiles and friendly attitudes of the attendants at shops and markets allowed me to see the humbleness and warmth of these individuals. And the Thai people were genuinely helpful and concerned. I rented a motorbike for transportation and, not surprisingly, I frequently got lost. During one of my vanishing acts I stopped by the side of the road, took out a map and attempted to locate myself. As I stared at the map, a stranger came up, looked at the map, pinpointed my location and directed me towards my destination. On another occasion I fell from my motorbike as I made a turn. To my rescue came five Thai people I had never met; they picked up my motorbike and belongings and, after they were sure I was not hurt, cheered me on as I got on the bike and drove away.

I will never forget the experience of walking up Doi Suthep, a mountain with a temple on the top, as part of a freshman initiation ritual. As I walked I actually felt the companionship among the students, all of whom walked in groups, cheering, making jokes, having a great time. Along the way many people I did not know cheered me on and walked with me offering support.

Being accepted as an individual of the world, welcomed for my personality and who I am, rather than as a "Mexican Minority" from L.A., was a very refreshing experience. There is no question that the time I spent in Thailand changed my life and made me much more tolerant of people. I am extremely thankful for the experience and encourage other students who might have such an opportunity to take it.

Next Tropical Biology Semester Set, Spring 2005

Start planning now! The next offering of the Tropical Biology Semester, the only such program in the entire CSU system, has been scheduled for spring 2005. Says Dr. **Paula Schiffman**, one of the program instructors, "The program

combines academics with natural history and hands-on research experiences."

All students in the program enroll in four courses for a total of 18 units. The first five weeks is spent on campus with lectures and lab activities covering background information, reading and discussing relevant literature, learning field sampling methodologies and experimen-

tal design and analysis. During weeks 6–10, the class travels to Costa Rica where it visits a spectacular array of tropical ecosystems. While at each field location, students have time to observe and identify organisms, devise research projects, and gather field data. The final weeks of the semester are spent on campus analyzing data, studying the primary

literature, writing papers and preparing posters on the field projects.

The program's courses meet the comparative and environmental biology requirements of the Biology B.A., and the zoology, botany, and ecology requirements of the Environmental Biology B.S. Prerequisites for enrollment are BIOL 106/106L, 107/107L and 322.

Students interested in an unforgettable experience should contact a course instructor (fritz.hertel@csun.edu, 677-3353; jennifer.matos@csun.edu, 677-2158; paula.schiffman@csun.edu, 677-3350).

Biology Faculty and Staff Honored, Recognized

Dr. **Steve Oppenheimer** received the Senator Richard Alarcon Community Award by way of State Senate Resolution 667. He received a similar honor via a resolution by the California Board of Equalization. The Community Award honors Dr. Oppenheimer's work with teachers that has resulted in publications and presentations of the research work of many of the teachers' students.

At its annual awards banquet, Sigma Xi, the Scientific Research Society, recognized the contributions of two members of the Biology Department. Dr. **Randy Cohen** received the George Lefevre Award for Distinguished Research. Dr. Cohen will present the George Lefevre Distinguished Research Lecture this year. Recipient of the Sigma Xi Outstanding Science Support Staff award was **Karen Moore**. Karen oversees the introductory Biology laboratories.

Dr. **Maria Elena Zavala** received an award as Local Hero of the Year from KCET Public Television and Union Bank of California in their celebration of Hispanic Heritage Month. Eight people were honored for exemplary work in the fields of social services, community activism, business, arts, and education; Dr. Zavala was honored as Local Hero for Education. University President Jolene Koester and others from Cal State Northridge joined invited guests from the Los Angeles community for the awards presentation at a gala reception at the KCET studios in Hollywood.

NSF "Improving Teaching Quality" Poster Symposium Attracts Large Audience

A poster symposium where K-12 students displayed the results of their research attracted hundreds of students, teachers and parents. According to Dr. Steve Oppenheimer, organizer of the event, "The Grand Salon was so packed with student posters that it was difficult to walk around." The symposium was intended to showcase the research efforts of local students under the guidance of teachers trained in Dr. Oppenheimer's research experiences programs.

"The Biology faculty have done outstanding work in training the teachers to do research that is then brought back to their classes. Our programs provide students at very early ages with the opportunity to begin doing creative science," says Dr. Oppenheimer.

Garden Party Sold Out

This year's Twilight Garden Party, the Botanic Garden's showcase event, sold out well ahead of schedule. The 220 guests lucky enough to get tickets spent the evening sampling good food, tasting wine contributed by Geissinger and Tantara Wineries, imbibing Kolsch style Hollywood Blonde beer provided by the Great Beer Company, and savoring coffee from Newhall Coffee Roasting Company. The event's goal was to raise funds for enhanced plant labeling, improved lighting and better pathways.

As they wandered the garden's paths, guests were serenaded by Kelly Corbin's jazz trio and had a chance to enjoy the watercolors, acrylics and ceramics of nine talented local artists. Winners of the Outrageous Raffle took home gift certificates from local restaurants, complimentary winery tours and plants donated by Monrovia Nursery and Rancho Santa Ana Botanic Garden. Kellogg Garden Supply, Wild Birds Unlimited, which had products on display, the Matador Community Credit Union, and Alumni Association provided financial assistance.

The event was choreographed by Botanic Garden staff members **Brian Houck** and **Brenda Kanno** with assistance from **Marisue Eastlake** and **Matt Rinnert** from the College of Science and Math Development Office. Dr. **Edward J. Carroll Jr.**, Dean, and Biology Chair Dr.

OPINION: Why BA Students Should Learn Statistics

— Dr. Steve Oppenheimer

I've never taken a statistics course. Though I have long found this hole in my education troubling, the importance of understanding statistics was brought to my attention once again at a recent NIH project director's meeting. At that meeting it was emphasized that an understanding of quantitative biology is essential for ALL biologists if they are to effectively compete in today's marketplace.

To move my own research forward, I have started learning stats myself. Thanks to the help of younger faculty my lab is now using statistics heavily in our papers and proposals. As a result, the quality of work in my lab has been enhanced. The effect of this is evident in the rapid acceptance of our recent papers and my appointment as an editor of a journal. In addition, my lab has again been funded by NIH for its research; the papers that the panel reviewed for the grant were full of data analysis. Also, I've been selected to serve on a NIH research grant evaluation panel, likely because recent papers from my lab, all of them full of quality statistical analyses, were seen by the NIH officers.

All segments of biology are becoming more quantitative. Ecology uses piles of statistical methods. Physiology has long relied on significance tests for comparing averages. Mendelian genetics uses a lot of χ^2 tests. Nowadays, it seems every nook and cranny in biology is enhanced by statistics. The analysis of DNA is very sophisticated, and to teach our students to do such analyses Biology now offers Bioinformatics (BIOL 503). All our graduate students must take this class, or the more traditional Biometry (BIOL 502).

Take statistics! A good place to start is Design and Analysis of Experiments (BIOL 330), an exciting blend of statistics and experimental design using biological examples relevant to studies being done at Northridge. If I were 20 again, I'd rush to take the course! The class may well be the most important elective you take. And there's no doubt about the consequences. Whatever your chosen biological career track—research, medicine, pharmaceutical sales, optometry, or whatever—familiarity with statistics and proper experimental design will help you shine!

Nancy Bishop greeted attendees. The garden was readied for the event and the food served by a cadre of Friends of the Garden volunteers—Gail Anderson, Darren Andre, Nedra Bushby, Joan Citron, Linda Cook, Helen DeGyrfas, Rita Desilets, John Diggle, Paula Hefter, Liz Kusak, Fran Lee, Bill Lee, Olivia Magana-Davidson, Jill Matosich, Anne Petach, Eve Romain and Boris Savic—plus a crew from the Vivarium supervised by **Toni Uhendorf-Sartain**. Also helping at the event were Drs. **Paul Wilson, Jim Dole, Jennifer Matos, Barbara and Larry Caretto** (College of Science and Math; Mechanical Engineering). Tim Gales made a photographic record of the event.

Many Biology grads who attended the party took the opportunity to join a new Biology Chapter of the Alumni Association; other Biology alums who wish to be a part of the emerging social group should contact Susan Crowther (661-362-3448 or susan.crowther@canyons.edu).

Next year's Twilight Garden Party, already scheduled for August 21, 2004, holds the promise of even more fun and socializing. Sponsorship inquiries are referred to **Matt Rinnert** at 677-6699.

***Selaginella* is Best Lycopod**

At the recent show of the International Fern Society, one of the Botanic Garden's plants not only placed first, but also received a trophy for Best of Division. Our *Selaginella pallescens*, also called "Sweat Plant," was obtained from Humboldt State University last spring. It has been quite happy in our greenhouse. (*Selaginella* is not a fern, but because it doesn't have seeds the fern society shows an interest.)

Argentine Scientist Visits

Dr. Fernando Lobo, of Argentina's Universidad Nacional de Salta, visited the lab of Dr. Robert Espinoza for three weeks. While on campus, Dr. Lobo worked with Dr. Espinoza on the phylogeny of the lizard genus *Phymaturus* and described two new species of *Liolaemus* lizards.

Cal State Northridge Hosts So. Cal. Academy Meeting

On May 9 and 10, the annual meeting of the Southern California Academy of Sciences was held at Cal State Northridge. Dr. **Cheryl Hogue** spearheaded the process of putting the meetings together and organizing all the events. Many other faculty, staff and students helped run the meetings, and several faculty acted as judges.

About 1/4 of the biological presentations were given by students and faculty of the Department. In what follows, we list only first authors and have trimmed out scientific names. •Dr. **Larry Allen**, "Documenting the return of a fishery?—Distribution and abundance of juvenile white seabass in the shallow nearshore waters of the Southern California Bight, 1995-2002." •Dr. **Steve Oppenheimer**, "Student research in K-12 classes mentored by teachers trained in university research labs." •Dr. **Cathy Coyle-Thompson**, "Research experience for teachers opens the door for research experiences for K-12 students." •Dr. **Virginia Vandergon**, "Tomorrow's scientist,

using a service learning model with pre-service teachers to run an after-school science program for middle schoolers."

•**Andrew Norris**, "The molecular evolution of the MYB gene family in bamboo and sorghum." •**Bryan Swig**, "Effects of contaminants on the growth patterns of Pacific sanddab from Santa Monica Bay and Dana Point." •**Maria Khurram**, "Bead analysis of human colon cancer cell surfaces." •**Eileen Heinrich**, "Preliminary studies on a new approach to development of cell type specific anti-cancer drugs." •**Lily Welty**, "Surface analysis of human colon cancer and non-cancer cell lines." •**Eric Miller**, "Initial protocols for the captive breeding and rearing of spotted sand bass in southern California." •**Brad Erisman**, "Spawning behavior of the kelp bass from Santa Catalina Island." •**Mia Adreani**, "Observations of courtship and spawning behavior in the California sheephead." •**Jana Cobb**, "Population dynamics and productivity of cryptic fishes." •**John Froeschke**, "A comparison of reef fish assemblages between Santa Catalina Island and the outer L. A. federal breakwall."

REMINDERS FROM THE ADVISEMENT CENTER

Advisement Center open 30 h/wk

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, Michelle Le, Sahar Sajadi** and **Lily Welty**. All advisors are highly knowledgeable, thanks to Dr. Maxwell's training program (funded by the NIH minority programs). The Advisement Center, Science 2133, is open 30 hours per week with times posted on the door.

Advisement required for spring

The University's computer will not allow Biology students to enroll in spring classes until they have received advisement. With more than 1200 Biology majors, the lines at the Advisement Center can be long, especially as TTR approaches. To avoid waits, Dr. Maxwell suggests students visit the Center now. Each student's signed "green slip" will be held in the office and approval to enroll entered into the computer at the appropriate time.

ate time.

Plan to graduate in 2005?

Undergraduates expecting to graduate spring or summer 2005 must file Graduation Evaluation and Graduation Application forms no later than the last week in April. Students may have the forms completed at the Biology Advisement Center.

Don't put off writing exam!

Students expecting to graduate must pass the Upper Division Writing Proficiency Exam no later than the semester in which they have completed 90 units. Students planning to graduate this year (spring '04) must pass the exam no later than April 24. 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.

Summer is for the Birds

Marisa Korody, a recent Biology graduate, had a chance to hone her field skills after being selected for a summer field internship. Marisa spent the summer studying polymorphism in White-throated Sparrows at the Cranberry Lake Field Station in upstate New York. Her job included the mistnetting and banding of birds, nest observation and data collection.

Herbarium Nears 20,000 Specimens

The Herbarium is now close to having accessioned 20,000 specimens. We took this round number as an opportunity to interview Dr. **Jim Hogue**, the collections manager.

Bios: What is a herbarium?

JH: A herbarium is a collection of plant specimens. Unlike a botanic garden where the specimens are living, herbarium specimens are dried and glued to large pieces of paper. Each specimen is accompanied by a label saying where it was collected, and when.

Bios: What are the specimens used for?

JH: Our herbarium finds its greatest use in teaching classes and in projects being done by students. It serves as a source of reference material that aids people in their efforts to put names on plants. There's really no better way to be sure of your identification than to compare a plant in hand to a correctly identified specimen. Herbaria also serve as repositories for specimens that document the diversity and distribution of plants on Earth. When a botanist maps the distribution of a species, each dot on the map should represent a herbarium voucher. Taxonomic research and the resolution of questions in systematics, ecology, and evolutionary biology requires the examination of organisms. Since much of this examination is impractical or impossible using living specimens, properly collected and preserved specimens are what we go on.

Bios: How many specimens do you accession a year?

JH: In the past six years we accessioned an average of about 250 specimens a year. During this time we added 362 species new to the collection, 52 new genera, and seven new families. Last year was a particularly good one.

Bios: Where do specimens come from?

JH: Because CSUN is in southern California, most of our collection is from this area. Geographic representation diminishes as you get outside the state and farther from the southwestern regions of the United States. On the other hand, we do have specimens from many regions worldwide. Recent acquisitions include material received on trade from northern California and some small collections generated by students, professors, and myself from the mountains of seven western states, southern California deserts, Kentucky, Nova Scotia, and Costa Rica. We also get a few interesting specimens each year from the collections made during the spring botany classes, and good specimens even if they wouldn't add directly to our collection can be used for trade.

Bios: How might a student get started contributing specimens to the collection that you would value?

JH: Take one of our botany classes or pay a visit to the herbarium for some tips on plant collecting. The best way to increase the probability of finding something we don't already have is to get out of southern California. And of course, the more plants you know, the easier it will be to spot cool stuff.

Bios: What about organisms other than plants?

JH: Well, since you mention it, there's insects! But that might be best saved for another issue of *Bios*, since it is such a large topic of such enormous interest.

E & E Discussion Group Set

An ecology and evolution discussion group meets on Fridays at 3:00 PM in Science 1322. Says Dr. Paula Schiffman, "This is an informal gathering at which research is discussed and snacks are consumed. Topics for discussion are selected by consensus of the group." Sometimes the focus is a paper from the recent scientific literature but at other times discussion centers on on-going student and faculty research projects. Students interested in field biology are invited to join in.

Microbiology Student Association Seeks Officers

At press time, the Microbiology Student Association is looking for new officers to serve during the 2003/04 academic year. Last year's officers were **Raquel Martinez** (President), **Denise Bell** (VP), **Natalie Chikhani** (Treasurer), and **Emerald Yu** (Secretary). Their service is much appreciated.

If you're interested in serving this year, please speak with one of the microbiology professors. Many activities will be planned. Says Dr. Nancy Bishop, "Look on bulletin boards around the second floor of Science 4 for announcements on meetings and upcoming events." Dr. Bishop also offers her thanks to those who participated in the lab-coat sale.

Pre-dent Club Plans Activities

The Pre-dental Club is preparing for a busy year. Newly elected club officers, **Aaron Benitez** (Pres.) and **Said Esfahani** (VP), already have some activities planned.

At an early meeting club members will hear a representative from USC's dental school. Because USC has changed its teaching method and is now using a problem-based learning approach, students thinking of attending that institution will find this an invaluable opportunity to ask questions.

Other programs are in the planning stage. All will be announced via postings around the Science Buildings and sent electronically to students who ask. Students wishing to join the club should see Dr. **Mary Corcoran** in her office (Science 3216B) or contact her via email at mary.corcoran@csun.edu.

Pre-dental News

Dr. **Mary Corcoran**, pre-dental advisor, says that last fall (2002) 23 Cal State Northridge students entered dental school, compared with 28 the preceding year. (Data for fall 2003 are not yet available.) Says Dr. Corcoran, "Both these numbers are above our 17-year average of 20.5 per year."

Of this University's students who elect to enter dentistry, the vast majority, about 30-35%, go to USC. UCLA and UOP each get about 12%, and another 5%

attend UCSF. The most frequently attended out-of-state schools are New York University and Boston University, according to Dr. Corcoran.

Students planning a dental career would do well to concentrate on learning biology and chemistry well, since the two subjects make up a large part of the Dental Admission Test. Maintaining a high GPA is also critical. Says Dr. Corcoran, "Dental schools usually expect scores of 16 or higher on each section of the DAT and a minimum GPA of 3.0."

Dr. Corcoran is available for pre-dental advisement every Wednesday between 10 and 12. Her office is in Science 3216B; no appointment is necessary. If the scheduled time is not convenient, contact Dr. Corcoran via phone (677-3348) or email at mary.corcoran@csun.edu.

Faculty Serve as Editors, Officers, Panelists

Dr. **Janet Kübler** has been appointed a member of the *Journal of Phycology's* editorial board.

Dr. **Steve Oppenheimer** was invited to serve on a NIH research grant review panel, in Maryland. On separate notes, Oppenheimer edited volume 8 of the *Journal of Student Research Abstracts*, and is engaged in manuscript evaluation for *Acta Histochemica* as part of his duties on that journal's editorial board.

Dr. **Robert Espinoza** has been appointed an associate editor for *Herpetological Review*. He has also been elected to the Board of Governors of the American Society of Ichthyologists and Herpetologists.

Dr. **Tacheeni Scott** recently served on a panel for the Howard Hughes Medical Institute judging predoctoral fellowship nominations of promising researchers in the biological sciences.

NIH Programs Fund Student Summer Experiences

Over the summer, seven NIH-funded minority students had an opportunity to work in research labs at other institutions. Doing so provided the students valuable research experience and exposure to different local cultures. Participants included: •**Marisa Briones** who worked at Caltech on a project entitled, "Design & testing of engineered IgG antibodies with increased in-vivo half lives";

•**Matthew Danielczyk** at the Rocky Mountain Biological Lab where he studied "Pollen presentation in *Penstemon*"; •**Omar Escamilla** at Thailand's Chiang Mai University, "Secondary data analysis to study the synergistic effects of indoor radon gas and smoking as risk factors for lung cancer"; •**Rosanna Kirkendall** who at Tufts University worked on "Determination of Troponin T & Troponin I HR responsible for coiled-coil interaction"; •**April Ochoa** at the University of York, "Does nocodazole induce cell retraction via RHo and RoCK pathways in oligodendrocytes"; And •**Evelyn Soriano** who at the University of London worked on a project entitled, "Different distributional pattern of localization in neuroplastins glycoproteins 65 and 55 when tapped to EGFP and DsRed constructs."

The application period for next summer's research internships is January 15 to March 15. Forms are available in the MARC, MBRS & Bridges office, Science 2130. All research experiences are paid.

Genetics (BIOL 360) Can Include Personal Study

According to Dr. **Virginia Vander-Agon**, genetics is an important subject for all biology majors. "But," she says, "because so many diseases and other morphological and physiological phenomena have a genetic component, a thorough understanding of genetics is particularly critical for students who plan to go on to medical or graduate school." In an attempt to ensure that genetics students fully appreciate genetics' role in the lives of people, Drs. Vandergon and **Rheem Medh**, have added a human component to the basic genetics course (BIOL 360) they both teach.

Students taking Genetics from the two professors now may add an optional "service learning component" to the course, tutoring, coaching, or in some other way helping out in programs involving people with genetic disorders. Some subjects are participants in the Special Olympics, in New Horizons, or are students attending a school for the disabled. The student identifies a subject, conducts a literature search about the individual's genetic disorder, and interviews the subject or a family member about relatives. Combining knowledge of the disorder and the case study, a pedigree is then constructed to

identify how the disease was or might have been inherited.

Says Dr. Vandergon, "Students last year were very excited about the service learning program and had a great time participating. A few continued to volunteer even after they fulfilled their hours for the course." One of the students wrote in her evaluation, "I have always wanted to volunteer, but I never seemed to have time... I never realized how just an hour and half a week could make such a difference."

Local Teachers Learn to Make Science Meaningful

Over the past summer, teachers of fifth through the eighth grades had a chance to improve their knowledge of science, and to learn to better relate science to their students. Under the guidance of Drs. **Virginia Vandergon**, **Steve Oppenheimer**, **Cathy Coyle-Thompson**, **Gerry Simila** (Geology) and **Norm Herr** (Secondary Education) the teachers became familiar with the basic scientific principles included in state-adopted textbooks and were led through many hands-on scientific activities that they could take back to their classrooms.

The goal of the program, dubbed the San Fernando Valley Science Project, is to prepare the teachers to teach science more effectively. As they become adept at doing so, it is expected that these teachers will assist their colleagues as well.

Because so many local students have a poor grasp of English, program participants also learned how to better reach the English language learner. Instruction in this part of the program fell to Drs. **Ana Serrano** and **David Kretschmer** of the Elementary Education Department.

Marine Biology Program Riding High

Marine Grad Numbers Swell

The Marine Biology program has seen a marked turnover in its graduate students as those completing their Master's degrees move on to doctoral programs or other endeavors and are replaced by new students, many from other Universities.

Robin Elahi, a graduate of Northeastern University, joined Dr. Peter Edmunds' lab this semester; the two met in Jamaica during the East/West marine biology program.

Stevie Adams and **Jonathan Williams**, both from University of North Carolina, Wilmington, and **Bridgette Nace** from CSU San Bernardino, have joined Dr. Larry Allen's lab where they are beginning their studies on fishes.

Dr. Robert Carpenter's lab has gained three new graduate students: **Kathleen Morrow**, also from UNC Wilmington, will study kelp forest community ecology; **Annaliese Hettinger**, from Dalhousie University, expects to investigate effects of water flow in kelp forests; and our own **Kylla Benes** will study population dynamics of red algal communities.

Joining the lab of Dr. Steve Dudgeon and his wife, Dr. Janet Kübler, is **Rebecca Kordas**, a graduate of the University of Chicago, who will be looking at latitudinal variation in the interactions between barnacles and fucoid germlings; **Craig Didden**, a graduate of Humboldt State University and a former junior high school teacher, who plans to study how grazer diversity affects the rate of energy flow in kelp forests.

Allen Plans Fish Symposium

Dr. **Larry Allen** has organized an all-day symposium titled "The Ecology of California Marine Fishes" to be held as part of the Western Society of Naturalists Annual Meetings (Nov. 7-10) in Long Beach. The Saturday (Nov. 8) symposium will include presentations highlighting representative chapters from the upcoming book of the same name to be published by the University of California Press. Drs. Allen, M.H. Horn (CSUF) and D.J. Pondella (Occidental College) are editors of the volume.

Edmunds Lab Visits Many Reefs

Dr. Peter Edmunds and his team of students have found themselves with a heavy travel schedule in 2003. Multiple research trips to Jamaica have allowed **Laurie Reque** both to work for 10 weeks as a TA for the East/West Marine Biology Program and to complete a portion of her study on how algae affect the photophysiology of reef corals. Graduate student **Geoff Horst** also visited Jamaica where he began investigating how global climate change and varying levels of carbon dioxide influence coral growth.

Together with colleagues from UCLA and the University of Queensland, Australia, Dr. Edmunds and some of his students spent two weeks at the National Undersea Research Center in Key Largo, Florida. The two-year project was initiated to determine the effect of rising seawater temperature on the reproductive biology of reef corals. "But," says Dr. Edmunds, "the corals may be showing a large scale repro-

ductive failure since both this year and last they failed to yield larvae during the full moon in May, the season when they traditionally reproduce."

Dr. Edmunds also spent many weeks in the U.S. Virgin Islands continuing his 17-year study on long-term changes in coral reefs. The coming year, while on sabbatical leave, he expects to expand his studies to French Polynesia where he plans to move his research in new directions.

Marine Biology Profs in Belfast

Over the summer, **Drs. Janet Kübler** and **Steve Dudgeon** worked in the laboratories of their collaborators, Drs. Christine Maggs and Jim Provan of Queen's University, Belfast, Northern Ireland. "We were able to get PCR products and sequences for two genetic markers, a pseudogene of enolase, and the plastid-encoded *tufA-rpl31* protein complex, the latter a new marker for red algae. It was a productive few weeks in Belfast," says Dr. Dudgeon.

Caribbean Sea Urchins Studied

This past summer Drs. Edmunds and Carpenter initiated a study of the spiny black sea urchin in the Caribbean. Data collection began in Barbados and Grenada where the duo attempted to determine if the urchin populations, which were decimated in 1983 by an unknown disease, are again increasing and, if so, what effect their grazing has on the now-common algal "lawns," hence indirectly on the growth of corals. Six more trips to various Caribbean islands are scheduled.