The true-life tale of two UCSC eco-sleuths seeking to solve the riddle of...

What's Killing Panama's Coconut Palms?

PLUS:
- A UCSC historian's new "biography" of the Rhine River
- A UCSC biochemist's search for medicines in marine sponges
In the face of fiscal uncertainty, we have launched a campuswide budget planning effort to preserve UCSC’s commitment to superlative instruction, world-class research, and public-service activities that make a positive difference to society.

By M.R.C. Greenwood

UC Santa Cruz alumna Maya Rudolph, fulfilling a lifelong dream of becoming a cast member on Saturday Night Live, stars in TV sitcoms each week in her eclectic mix of fictional and real-life characters, including over-the-top fashion designer Donatella Versace.

The initiator, under the leadership of Campus Provost and Executive Vice Chancellor John B. Simpson, will identify options for reducing our expenditures—with a goal of preserving UCSC’s commitment to superlative instruction, world-class research, and public-service activities that make a positive difference to society.

But we also need your help. In the budget deliberations that will take place in the months ahead, we will need members of the UCSC community to join us in advocating not only for this campus, but for the University of California system. Our message will be simple: The state’s continued investment in UC is critically important to today’s students, to those who will enroll in future years, and to our society as a whole.

We also will need the continued support of the many contributors who have made it possible for UCSC to achieve national distinction for the quality of its people and programs. The private support we receive from alumni, parents, other individuals, foundations, and corporations provides crucial funding for undergraduate scholarships and graduate fellowships, research activities, and the classrooms, labs, and other facilities in which our students prepare for their futures.

By working together now, UC Santa Cruz will not only weather this budgetary crisis, it will continue to build upon its legacy of innovation, excellence, and achievement.

The two family members, Gregory Gilbert and Jogral Parker, have waged a relentless battle against a mysterious disease that is threatening Panama’s coconut palms—and the life and livelihood of a little-known indigenous community, the people of the Kuna Yala.

M.R.C. Greenwood
Chancellor
Three UCSC professors included in top-50 list of women in science

The popular science magazine Discover has named three women on the faculty of UCSC among the “top 50 women scientists in the country” in an article in the magazine’s November issue. The issue features a series of articles about how women fare in science and celebrates the accomplishments of women scientists.

The three UCSC scientists featured in the magazine are Sandra Faber, University Professor of astronomy and astrophysics; Terrie Williams, professor of ecology and evolutionary biology; and the Ida Benson Lynn Professor of Ocean Health; and Marcia McNutt, professor of Earth sciences at UCSC and the president and CEO of the Monterey Bay Aquarium Research Institute. (McNutt is identified in the magazine by her primary affiliation with MBARI.)

“I’m impressed that three women scientists from UCSC are represented on this list, and I think it reflects the fact that UCSC’s science faculty is absolutely first class,” Faber said.

Faber is renowned for her research on the formation and evolution of galaxies and the evolution of structure in the universe. She has also been involved in the development of the Hubble Space Telescope and the Keck Observatory.

Williams, an expert in animal physiology and energetics, has studied a wide range of marine mammals, including dolphins, seals, sea otters, and whales. Her research projects include studies of Weddel seals in Antarctica, Steller sea lions in Alaska, and sea otters in Alaska and California.

McNutt is a geophysicist whose research focuses on the physical properties of the Earth beneath the oceans. Recent projects include the study of volcanism in French Polynesia and how it relates to broadband convection in the Earth’s mantle, continental breakup in the western United States, and the uplift of the Tibet plateau.

UCSC center part of project to improve science education

The new teacher center at UCSC will play a key role in a five-year, $7.5 million National Science Foundation (NSF) program to develop and implement an online mentoring program for beginning science teachers.

The project, which aims to improve student learning by bolstering the effectiveness of new middle and high school science teachers, is a perfect fit for the New Teacher Center (NTC), which is dedicated to improving education by promoting the development of an excellent teaching force.

The NTC’s successful model of teacher induction provides mentoring support of an experienced teacher to all new teachers during their first two years in the classroom. This NSF project will tap NTC to design and administer an e-mentoring system to support beginning teachers in six urban California school districts and a consortium of rural districts in Montana.

Chancellor’s visit emphasizes Indian and South Asian studies

In December, Chancellor M.R.C. Greenwood represented the campus at a series of events in New Delhi, India. Hosted by UCSC Foundation trustees Anu Luther and Kamal Hasan, the visit provided opportunities to renew connections made during a 1998 visit.

The chancellor met with the president of India and other leaders in government and education, and she delivered an address at the prestigious India International Centre. A highlight of the trip was the wedding of Minal Hasan, the daughter of Kamal and Talat Hasan.

UCSC receives $9.1 million to establish adaptive optics lab

UCSC has received a grant of $9.1 million from the Gordon and Betty Moore Foundation to establish a Laboratory for Adaptive Optics. The new laboratory strengthens UCSC’s position as an astronomy powerhouse and a national center for research on the exciting new technology of adaptive optics. The grant is the largest contribution from a private foundation in UCSC’s history.

The Laboratory for Adaptive Optics will develop innovative instrumentation for the application of adaptive optics technology in astronomy. Adaptive optics sharpens the vision of ground-based telescopes by removing the blurring effects of turbulence in the Earth’s atmosphere.

The new lab will “play a major role in the future of astronomy and other fields where high-quality images are important,” said Ed Penhoet, senior director of science and education at the Moore Foundation.

Chancellor Greenwood and Anna Luther

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Chancellor Greenwood and Anna Luther

The UC Santa Cruz Review / Winter 2005

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$2 million grant funds research on Monterey Bay ecosystem

UCSC has received a grant of $2 million from the National Oceanic and Atmospheric Administration (NOAA) to establish a Center for Integrated Marine Technologies. The center will use new technological approaches to study the processes driving the highly productive coastal upwelling ecosystems along the California coast.

The aim is to establish the scientific basis for effective monitoring and management of these ecosystems and the fisheries and other resources associated with them. The center brings together an interdisciplinary group of researchers from five institutions around Monterey Bay, with UCSC at the lead institution. Other partners are the Monterey Bay Aquarium Research Institute, the Naval Postgraduate School in Monterey, Moss Landing Marine Laboratories, and the National Marine Fisheries Service Laboratory in Santa Cruz.

The Monterey Bay National Marine Sanctuary is also involved, said Gary Griggs, a principal investigator on the grant.

In a way that is accessible and can be visualized, both for scientists and for public users groups. The California coast is one of just five major coastal upwelling regions in the world. While they make up only these regions of a percent of the ocean’s surface area, upwelling regions account for 95 percent of the global marine biomass and more than 21 percent of the world’s fisheries landings.

Undergrad takes tech skills to Fresno youth

S ocioLOGY MAJOR Mary Jane Skjellerup is reaching out by reaching back—to Fresno High School, that is. Skjellerup is using the power and allure of technology to introduce Hispanic and Latino youth in her native Fresno to what’s available for them at the university.

Skjellerup, a graduate of Fresno High School and a senior at UCSC, has launched the Community and Technology Leadership Program to encourage Fresno students from disadvantaged backgrounds to get on track for college. She uses hands-on training in sophisticated digital media technology, mentoring, and academic advising to give teenagers a taste of what’s available to college students.

“I want to encourage kids to come to the university by giving them skills that will boost their confidence and make them feel unique,” said Skjellerup.

With little more than her own commitment and minimal start-up funds from UCSC’s Global Information Internship Program, Skjellerup developed a proposal that Fresno High administratorsjumped at. The school’s business computer technology teacher, Helen Herzog, and her department chair, Delaine Zody, selected six high school students who came to UCSC for a two-day summer workshop. Tapping the two-inch-thick training manual she put together for the workshop, Skjellerup describes a daunting itinerary that covered admissions, a tour, web and graphic design instruction, and a one-day digital film and editing course.

The students returned to high school this past fall, where they worked with Skjellerup and their teachers on community-service projects to prepare oral histories of members of the Hispanic and Latino communities in Fresno.

Campus mascot inspires children’s book

A new children’s book explores a day in the life of a colorful banana slug family that lives on the UCSC campus. All proceeds from Sally Slug benefit the UCSC Foundation and provide for art history purchases and exhibits in the library.

The book is written by Anne Neufeld Levin and illustrated by alumna Patricia Rebele. Both serve on the Foundation and are generous supporters of UCSC.

To purchase the book, go to: slugstore.ucsc.edu.
New award honors three generations of UCSC scholarship

A new annual award, linking three generations of academic excellence at UCSC, was presented for the first time during a Stevenson College Night in October. History lecturer Bruce Thompson is the recipient of the John Diikes Award, established this year by the Humanities Division to honor outstanding teaching by humanities faculty, and named in honor of one of UCSC’s founding faculty members.

In addition to his $3,000 award, the recognition enabled Thompson to select an undergraduate to receive a $3,000 scholarship. Thompson chose major Shelby Polakoff as the scholarship recipient. “I remember seeing a flyer announcing the establishment of the John Diikes Award,” said Thompson, “and I thought it was a wonderful idea. I think John’s one of the most extraordinary teachers I’ve ever met. It never occurred to me that I’d be the first recipient of an award named for him.”

Diikes, a professor emeritus of American studies, came to UCSC in 1965. A winner of the UCSC Alumni Association’s Distinguished Teaching Award, Diikes has published numerous books and articles, and served as Cowell College provost, and mentored thousands of students during close to 40 years at UCSC. He continues to be an active member of the campus community.

In announcing Thompson as the Diikes Award winner, dean of humanities Wlad Godzich cited Thompson’s intellectual influence on undergraduates and graduates, his support and advising of large numbers of students, and his ability to teach many different topics in history.

UCSC publishes book on work of architect Marcel Sedletzky

The first book on the life and work of Monterey Bay architect Marcel Sedletzky has been published by UCSC’s Center for Stock Assessment Research (CSTAR). Sedletzky’s architecture is recognized for combining modernity with a sensitivity to the views and terrain of the California landscape. His style is a “blend of Le Corbusier’s forceful modernism and Frank Lloyd Wright’s organic fusion of housing form with place,” writes John King, the San Francisco Chronicle’s urban design critic, in his introduction to Marcel Sedletzky: Tree House, Carmel, 1964.

In Memoriam

NORMAN O. BROWN, professor emeritus of humanities and author of Life Against Death and Love’s Body, died in October at his residence in Santa Cruz. He was 89. Brown was known for his influence on the classics, psychology, history, and philosophy.

Raymond F. Dasmann, a founder of international environmentalism and a professor emeritus of ecology, died in November in Santa Cruz. Dasmann had been in ill health for several years. The cause of his death was pneumonia. He was 83.

Dasmann was the author of more than a dozen books, including The Destruction of Professional Conservation, Wildlife Biology, and California’s Changing Environment.

Dasmann made an impressive plea for sustainability on a planet with limited resources. In his career, Dasmann did pioneering work in the 1960s with the United Nations Educational, Scientific, and Cultural Organization (UNESCO), where he helped launch the Man and the Biosphere program. For most of the 1970s, he worked in Switzerland as a senior ecologist for the International Union for the Conservation of Nature. He joined the faculty at UCSC in 1977 and retired in 1989.

Dasmann’s efforts earned him many major international awards, including the top conservation medals of the World Wildlife Society and the World Wildlife Fund. He received the John Dizikes Award, named in honor of one of UCSC’s founding faculty members, established by the late Senator J. William Fulbright of Arkansas, to build mutual understanding between the people of the United States and countries around the world.

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In addition to training fishery scientists with expertise in the quantitative assessment of fish populations, UCSC and the National Marine Fisheries Service (NMFS) have established the Center for Stock Assessment Research (CSTAR). In the late 1990s, NMFS sponsored a project to develop software to assess fishery populations. To create the software, NMFS worked with scientists at UCSC, including NMFS biologist Alec MacCall, and NMFS fishery scientists from several West Coast states.

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Graceful coconut palms are a fixture of the tropical landscape from Hawaii to Puerto Rico. Along Panama’s scenic Caribbean coast, the statu- esque trees dot the shoreline like pearls on a necklace.

The Kuna Yala region of Panama, made up of a 400-kilometer stretch of sandy beaches and 300 nearby islands, remains largely undiscovered by tourists. A semi-independent republic established in 1925, Kuna Yala is home to the Kuna Indians, an indigenous group whose subsistence lifestyle remains largely unchanged from the ways of their ancestors, who first inhabited the area in the 1600s. Each morning, islanders paddle dugout canoes short distances to the mainland to collect freshwater, harvest coconuts, and work small farm plots. Women in colorful blouses adorned with their hand-appliquéd needlework sit before thatch-roofed huts, tending children and preparing coconut-based dishes over open fires.

But in 1994, a mysterious disease began ravaging Panama’s coconut palms, stunting new growth, stiffening leaves, and quickly killing many of the towering 60-foot trees. Unlike in Florida, where an outbreak of disease in the 1980s threatened the state’s famous palm trees and triggered a well-funded and organized response from horticultural researchers, there was no outcry as this new disease took hold in Panama, jeopardizing the diet and economy of the Kuna.

Instead, a pair of adventurous young UC Santa Cruz plant scientists took up the challenge on their own time, slowly gaining the trust of the Kuna as they tracked the disease for several years. As the urgency of their undertaking grew, these dedicated researchers had to overcome the shortcomings of their training and follow the path of environmental science today—where ecological crises demand top-notch scientific skills and knowledge of anthropology, economics, political science, and sociology. As in many epidemics, answers remain elusive. But the researchers have compiled an arsenal of data that will prove invaluable in their battle to assist this little-known indigenous community.

Gregory Gilbert was a plant pathologist doing postdoctoral research with the Smithsonian Tropical Institute in Panama in 1994 when agronomists in Panama’s Department of Agriculture made a troubling observation: Coconut palms in the Panama Canal region were getting sick and dying. Their new leaves were coming in dwarfed and deformed, then dying, leaving “headless” trunks that looked like the skeletal remains of the dead.

Gilbert and his government colleagues immediately feared what they would later confirm: An unknown pathogen that has wiped out thousands of palms in Colombia since the 1950s was gaining a foothold in central Panama.

The disease, nicknamed Porroca (pore-OH-kuh), an indigenous word for “little leaf,” had traveled in spurts west from Colombia since the 1950s as it was gaining a foothold in central Panama. The disease, nicknamed Porroca (pore-OH-kuh), an indigenous word for “little leaf,” had traveled in spurts west from Colombia since the 1950s as it was gaining a foothold in central Panama.

The title and image of the article are: "UC Santa Cruz associate professors Gregory Gilbert (environmental studies) and Ingrid Parker (biology)"
ed in Panama’s eastern, least-populated region. Its appearance near the canal was bad news, but government funding to tackle the problem kept falling through.

In 1996, Gilbert returned to the United States to take a faculty position at UC Berkeley, promptly securing a small grant so he could return to Panama to study P. orzechellii. Gilbert enlisted the help of Ingrid Parker, a postdoctoral biologist doing work on the effects of nonindigenous organisms on native plants. What began as professional compatibility eventually grew; they married in 2001.

Gilbert and Parker, now associate professors of environmental studies and biology, respectively, at UCSC, first traveled to Panama together in 1998, when they began mapping each and every coconut palm in Kuna Yala. “We needed to know the baseline distribution of P. orzechellii in the area,” said Gilbert.

The infestation appeared to be in the early stages. They documented the “patchy” presence of P. orzechellii in the Kuna Yala—some areas were devastated, but most were largely untroubled—and they saw the need for a comprehensive evaluation of the region’s coconut palms. Parker returned to California, while Gilbert stayed behind for a week of vacation that would prove fortuitous for everyone.

During his stayover, a former colleague asked Gilbert to give an impromptu lecture about P. orzechellii to a group of ecotourists on a stopover in the Panama Canal. One visitor was so impressed by what she heard that she cornered Gilbert and asked for a funding proposal. She wanted to help him conduct the kind of long-term research that would “make a difference” (see story, p. 13).

Within weeks, she had provided $20,000 in funding with a promise of more to come, and Gilbert and Parker were back in business. During the following three years of intensive fieldwork, they mapped 200,000 trees, noting which were diseased and which appeared healthy. Early on, the hardest-hit areas were suffering from an infection rate of about 20 percent. By the next year, however, the infection rate in some locations was up to 50 percent. “It was massive,” said Gilbert.

“We need to know how the disease is transmitted,” Gilbert said. “If we can determine how it spreads, we can develop a strategy to stop it.”

Gilbert and Parker approached the Kuna with respect, but they “Many of the trees that had beeninfected the year before were now dead.”

Porroca was on the run. Seeing its potential to destroy the Kuna’s palm trees and to the tree’s entire ecosystem. In 1993, the Kuna started to document the “patchy” presence of P. orzechellii in their region. By 1998, the infection rate had reached 20 percent. The following year, it had increased to 50 percent. The disease was spreading rapidly.

Community cooperatives clear small parcels along the coast to cultivate coconuts, bananas, plantains, fruit, and root crops like yucca, but old-growth forests still dominate the interior. In 1983, the Kuna set aside a 148,000-acre expanse of virgin rainforest along the southern border of their holdings as a territorial defense, becoming the first indigenous group in Latin America to establish, in effect, a nature reserve. The move attracted widespread support from international conservationists. But it is largely the coconut palms that ensures the success of the Kuna’s subsistence lifestyle.

With a population of 32,000, the Kuna rely on coconuts as their top cash crop and only export. In 1999, they add 5.6 million coconuts, largely to Colombia, where coconut oil is a key ingredient in soap and perfume. When the market for coconuts crashed in the early 1990s, exports plummeted to 3.2 million. The Kuna turned to commercial fishing to replace the lost income and have so far avoided the temptations of commercial forestry and mining.

But their commitment to conservation could be tested if economic pressures mount. “They have a great tradition of conservation, largely because they’ve had other sources of income,” said Gilbert. “If they lose the production of coconuts because of disease, that could push them to do other things. They value their forest, but they can only afford to preserve it if they’re able to survive by other means.”

Gilbert and Parker approached the Kuna with respect, but they continued on page 12

The Kuna Yala region of Panama is a 400-kilometer stretch of beaches and nearby islands. Since the 1600s, Kuna Yala has been home to the Kuna people, an indigenous group whose lifestyle and livelihood depends on the health and bounty of the native coconut palms. In 1994, an outbreak of Porroca—a disease that spread west from Colombia—began killing the coconut palms on which the Kuna depend.

The unparalleled pace of environmental degradation in the tropics calls for intervention, and one of UCSC’s newest research centers is helping transform the way universities and policy makers respond to the crisis. The Center for Tropical Research in Ecology, Agriculture, and Development (CenTREAD) is preparing undergraduate and graduate students to integrate human needs into research that addresses complicated environmental problems in the tropics.

“We as a nation are lacking the answers we need to address these crises,” said CenTREAD codirector Karen Holt, an associate professor of environmental studies at UCSC and coholder of the Pepper-Giberson Chair. “Solutions will require scientific training and research, but also an understanding of social, political, and economic systems.”

In Panama, CenTREAD codirector Gregory Gilbert and biologist Ingrid Parker’s ability to conduct scientific research could have been jeopardized if they weren’t sensitive, adept, and dedicated enough to overcome problems posed by the unique challenges of working closely with the indigenous Kuna people. They experienced firsthand the need for environmental scientists to broaden their academic preparation.

Established in 2000, CenTREAD builds on the expertise of UCSC’s faculty, whose commitment to interdisciplinary scholarship has attracted a “critical mass” of researchers and graduate students drawn to this new approach to ecological problem solving. For doctoral candidates like Ernesto Mendez, whose dissertation in environmental studies focuses on ways to help peasant coffee farmers in El Salvador, CenTREAD represents a high-level endorsement of integrated research. “I’ve had professors almost apologize to me because they see what’s involved,” said Mendez. “But I feel lucky. We need to train people to do this, and I really appreciate the willingness and commitment of faculty to put themselves out there for us.”

Mendez, whose father and grandfather farmed in El Salvador, is at the forefront of efforts to bring Earth-friendly farming to the tropics. For more than five years, he has shared his expertise in agroforestry and resource management with small-scale coffee farmers struggling to survive an international crash in coffee prices. Many are eager to diversify their plantations, but they lack the scientific knowledge to make changes, and they’re unsure of niche marketing opportunities like those created by the shade-grown coffee movement.

Blending the science of sustainable agriculture with an understanding of social needs is at the heart of Mendez’s research—and at the heart of international efforts to protect what’s left of tropical ecosystems. For example, Mendez’s research on coffee growers in El Salvador represents “huge conservation potential” because nearly 80 percent of coffee in El Salvador is grown by small operators, according to Mendez.

“What we need is a compromise that would include more farmers, so they can participate in conservation efforts and take advantage of new marketing opportunities,” said Mendez. “We have to compromise so farmers will also benefit. It’s not just about saving trees.”

Researchers working throughout the developing world are recognizing the need to incorporate broader knowledge of region-specific needs into their strategies to protect the environment. CenTREAD is offering specialists like Mendez, whose background includes a bachelor’s degree in agronomy and a master’s in agroforestry, training that encompasses fields like rural development, political economy, and anthropology.

The codirectors of CenTREAD are raising funds to support students from the tropics who want to come to UCSC, and to build a visiting scholars program to increase interaction and research collaborations between UCSC researchers and their counterparts in Latin America. —Jennifer McNulty

For more information, visit centread.ucsc.edu.
With Soo’s help, the researchers launched an educative campaign, offering workshops and publishing brochures in Kuna and Spanish to help residents recognize symptoms of infection. The Kuna were encouraged not to move coconut plants or seeds, and Gilbert and Parker enlisted their help in reporting new areas of infestation. Soo, a Kuna native who prefers to remain anonymous, is in for the long haul, having promised to fund the biannual trips that will enable Gilbert and Parker to see their project through to the end. Gilbert and Parker have gotten another lucky break. Although they’re not sure why, the Porroca epidemic seems to have stabilized. No major new infestations were identified in 2001, and a few sites actually disappeared due to the death or removal of diseased trees. “We saw a fair amount of recovery, up to 10 percent of diseased trees had recovered,” said Gilbert. In the meantime, Gilbert and Parker sound at times almost apologetic about what they’ve accomplished. It has become clear that they have overstated the potential they believed they had to make a difference.

“What a Difference One Donor Can Make *J. Carver managed money for the federal government for 35 years, so she knows about red tape—and how to cut through it. That's precisely what she has done for UCSC researchers Gregory Gilbert and Ingrid Parker, who've been on the trail of Porroca, the puzzling disease that's killing coconut palms in Panama. Since 1998, Carver has given more than $65,000 in no-strings-attached support to Gilbert and Parker’s work. She first learned about Porroca as an ecotourism in Panama in 1998, when Gilbert gave a presentation to her travel group about the spread of the disease onto Kuna Indian land and the threat it posed to a proud people who depend on coconuts for food and income. “I have never been more interested in what’s outdoors than what’s indoors,” said Carver, speaking appreciatively of the beauty of the woods around her Boston-area home, a region that was completely forested during the 17th and 18th centuries. “It seems that for anyone who does any reading, you’d want to do as much for sustainability as you can.” Carver’s help has literally kept the Porroca project alive. Unbeknownst to Carver until recently, Gilbert and Parker have donated their time to make her money go as far as possible. “We can’t imagine how lucky we are,” said Carver. “They’ve each pursued the Porroca project as a sideline to their primary research, squeezing in trips during quarter breaks and working without pay. Gilbert’s primary research is on the ecology in tropical and temperate forest ecosystems, while Parker’s current research focuses on pathogens among native and nonnative clovers on the California coast. “We’ve gotten a really good start on this problem that deep down we always knew would be a long-term thing,” said Parker. “But we all wish there’d been an easy answer.”
Tucked into a redwood forest in the Santa Cruz Mountains sits a little slice of Germany, a Tyrolean-style restaurant. One winter evening a guest asked if the dinner special, salmon with dill sauce, was an authentic German recipe. “No, it can’t be,” the waitress replied. “There are no salmon in Germany.” But the guest persisted. Perhaps it was an old recipe, he wondered, because there had been salmon in the Rhine, western Europe’s major waterway and the only river connecting the Swiss Alps to the North Sea.

In fact, annual salmon catches in the Rhine once ran at more than half a million, and German cookbooks featured plenty of salmon recipes. How could the waitress think there were no salmon in Germany? Because by 1950, well before the young woman was born, salmon had completely disappeared from the river.

Why the salmon vanished—and whether they can be reestablished—is part of a chilling environmental tale told by UCSC history professor Mark Cioc in his new book, *The Rhine*. Covering nearly 200 years of the river’s recent history, Cioc’s book describes a river sacrificed to economic progress, a story sadly familiar in industrialized nations. The book also describes more recent attempts by Rhine nations to reverse the devastating damage.

“Every country seems to insist on its sovereign right to go through the same problems with the environment, instead of learning from the experiences of other countries,” says Cioc. “For
Cioc, who calls salmon the “embodiment of the river’s soul and the foodstuff of myth and legend,” predicts that one day there will even be a self-sustaining salmon population, although only at a small fraction of the spectacular runs of the past.

“I thought when I was doing research for this book that it would be a story of decline and rebirth, but it’s really not,” says Cioc. “After a river has been manipulated to this extent, there’s a permanence to the damage.”

Cleanup efforts were accelerated by the catastrophic 1986 fire in a storage facility at the Swiss Sandoz agrochemical plant. Since the building lacked a sprinkler system, firefighters downded the blaze with hoses, sending 10 to 30 metric tons of raw chemicals into the Rhine. As the world watched, the chemicals washed down the river to the North Sea, wiping out virtually all fish and plant life along the way. The Sandox accident raised international awareness of environmental problems in the Rhine, and coincided with the Rhine nations’ cleanup discussions and the rise in-popularity of the German Green Party, a political organization which has as its core platform the protection of the environment. “All these factors combined to put more and more pressure on preserving the biology of the river,” says Cioc.

Today, the Rhine nations have established mechanisms to monitor, protect, and rehabilitate the river, and the Rhine is slowly recovering its water quality, a measure of its biodiversity, and some floodplains. The Rhine nations have even initiated projects designed to bring salmon back to the river. Spawning grounds and nursing areas are being restored. To circumvent dams and weirs blocking migration routes, fish ladders and passages are being built. But previous destruction of riparian habitats and trapping polluted water. Oil refineries and nuclear power plants joined the demise of the Rhine river, creating the Rhine Commission, declaring the river a shared commercial waterway and its banks free-trade zones.

The Rhine springs up in the Swiss Alps and flows north across Europe, through Switzerland, Germany, and France to the Dutch border. The Rhine’s upper stretches are responsible for much of Europe’s electricity, generating power for the Dutch and German economies.

“The notion that you can domesticate a river and it’s over and done with is absurd,” says Cioc. "After a river has been manipulated to this extent, there’s a permanence to the damage."
In some ways, animal life doesn’t get much simpler than a sponge, a creature with no mouth, gut, muscles, nerve cells, or sensory organs. A chopped up sponge can regrow from as little as a single cell. Surprising complexities, however, lie beneath the apparent simplicity of sponges. Organic chemists, for example, have been astonished by the unusual structures of some of the chemicals found in these “simple” organisms.

Sponges have been around for more than 500 million years, and genetic evidence suggests spongelike organisms were the ancestors of all animal life. Today, they are found throughout the world’s oceans—and even in fresh water—and come in an amazing variety of shapes and colors. Mostly, they sit in one place and feed on bacteria and other plankton by filtering enormous volumes of water through an intricate system of canals and chambers.

To hold their own in a sea teeming with predators and competitors, sponges have evolved a diverse array of chemical defenses. As stationery, soft-bodied creatures, their primary defensive strategy is to make themselves unpalatable or downright toxic. The potent chemicals that sponges use for protection have attracted intense interest from medical researchers and pharmaceutical companies seeking to develop new drugs.

Phillip Crews, a professor of chemistry at UCSC since 1970, is among the pioneers in the field of sponge chemistry. His Marine Natural Products Laboratory now holds an unparalleled collection of nearly 800 pure compounds—complex chemicals isolated from sponges and other marine organisms—as well as thousands of extracts containing mixtures of chemicals the lab has yet to separate and analyze.

In the 1980s, Crews published some of the first papers on the chemistry of sponges. Now, his research lab involves some 20 graduate students, postdoctoral researchers, undergraduates, and technical staff. Several major grants from the National Institutes of Health support the group’s ongoing projects and collaborations.

Their research takes Crews and other members of his laboratory on annual expeditions to remote tropical islands, where they explore the waters around coral reefs and other habitats, collecting sponges for chemical analysis.

“It’s neat to be a chemist and get to do scuba diving as part of the job,” says graduate student Chris Wegerski. “I was afraid of the ocean until I joined the lab, and now I love to dive.”

The researchers are careful to avoid overharvesting any particular sponge, and always leave behind part of each specimen so the sponge can regrow, says Karen Tenney, the lab’s research coordinator. “We know these are fragile ecosystems, so the collecting is carefully targeted,” she says.

Crews still remembers the day in 1974 when he decided to explore the chemistry of sponges. Thumbing through a book entitled Poisonous and Venomous Marine Animals of the World, he read that extracts from sponges had shown antibiotic and antiparasitic properties. Turning to the section on the chemistry of sponges, he saw just one word: “Unknown.”

“That was the moment when it struck me that this is what I should do,” Crews says.

Crews set about methodically acquiring the knowledge, skills, and equipment he would need to pursue this new path. Thru snorkeling, a book entitled Poisonous and Venomous Marine Animals of the World, he read that extracts from sponges had shown antibiotic and antiparasitic properties. Turning to the section on the chemistry of sponges, he saw just one word: “Unknown.”

“That was the moment when it struck me that this is what I should do,” Crews says.

Crews set about methodically acquiring the knowledge, skills, and equipment he would need to pursue this new path. Through the campus’s recreational department, he learned scuba diving so he could collect specimens. Later, he took sailing lessons so he could rent boats on his expeditions to the tropics.

continued on page 20
“There was a 10-year period when we learned how to organize ourselves to explore what were very remote areas,” Crews says. As an organic chemist with little background in biology or ocean sciences, he had to spend a lot of time learning about the natural history of sponges. Now, when Crews goes on an expedition, he knows what to look for: “We have a sense of what kinds of sponges are going to be important in terms of chemical leads, based on our experience in previous years,” he says. “We also know which ones have already been well studied, and we try to avoid those.”

Over the years, Crews has focused much of his collecting effort around the South Pacific islands of Fiji, the Solomon Islands, and Papua New Guinea. The variety of coral reef habitats in this region has given rise to both unique chemical and chemical diversity in the sponges. Crews has found that even within the same species of sponge, the chemistry can differ from one locale to another. The samples Crews and his colleagues collect go through an extensive extraction procedure designed to separate the components from the tissues of the sponge. It starts on the boat with a good soaking in a 50 percent alcohol solution (100 proof vodka) to stop the extraction, and concludes in the laboratory with a series of separation procedures, yielding a half-dozen crude liquid extracts from each specimen. It is then, really interesting work begins.

Each extract contains hundreds of chemicals, one of which may yield a new treatment for a disease like cancer or arthritis. The challenge is to find the potentially useful compounds. Biological assays or tests can be used to identify extracts with valuable properties. The National Cancer Institute, for example, has a standard battery of assays for antitumor activity. If an extract shows activity in one of these assays—stopping the growth of breast cancer cells, for example—the Crews lab can further refine it and try to isolate and characterize a specific compound that can serve as the basis for the development of a new drug.

Crews’s lab also searches the 20 years of expeditions is becoming increasingly valuable as new technologies emerge for analyzing the extracts and finding useful compounds. Technologies may speed up the pace of discovery. For example, assistant professor of chemistry and biochemistry Scott Lokey is setting up a robotic system that can screen 10,000 compounds in one day in an assay for selective destruction of cancer cells. New instruments also make it possible to purify large numbers of compounds in a short time. In the past, standard screening procedures involved running a relatively small set of crude extracts through an assay to see, for example, if an extract kills cancer cells. If activity is detected in one of the extracts, it is then further purified. The process of isolating and purifying individual compounds can take months. With instruments like the mass spectrometer, we’re able to get a sense early on of any novel chemistry in the organism,” Crews says. “That’s buttressed by the biological assays performed by our various collaborators and partners.”

Determining the exact chemical structure of a new compound can be a lengthy and complicated process. For Crews, however, it is the most interesting part of his research. Although much of his work has a very practical orientation, Crews remains at heart a theoretic organic chemist. What really gets him excited is the discovery of a new compound with a unique chemical structure. “Chemists can do combinatorial chemistry to create novel synthetic structures, but they’re never going to envision what nature can do. I look at nature as the ultimate chemist,” he says.

The most promising drug lead to come out of the program so far is a group of compounds called benzamides. Crews first isolated from sponges collected in the Benq Lagoon in the Fiji Islands. The benzamides have shown potent antitumor activity, and the pharmaceutical company Novartis has been investigating them for clinical use. A benzamide-derived drug is currently in clinical trials to test its safety and effectiveness as a treatment for breast cancer.

Sometimes the lab discovers compounds that are not entirely new but proof of old variants within a class of known compounds. The value of such discoveries often lies in the added complexity of the chemical structure or slight differences in biological activity, Crews says. Wegerski, for example, was screening a library of extracts from sponges collected in Papua New Guinea when he found some new types of manzamines, compounds previously shown to have antimalarial properties. “Papua New Guinea has a bad malaria problem, so it would be nice if something we discovered could help to combat it,” he says.

Drug leads are not the only useful products to come out of Crews’s library of chemical compounds and extracts. Some of the compounds his lab has isolated have proved to be very useful tools for cell biologists because they bind to and inhibit specific cellular proteins. These compounds can be used as molecular probes to tease apart complex biological processes. The Crews lab does out precious samples of these compounds to other scientists around the world. Crews is constantly moving forward into fresh territory—adopting new technologies, establishing new collaborations, and pursuing new areas of investigation. A few years ago, he began exploring the chemistry of marine microorganisms—both fungi and bacteria—may be the next place where we’re going to see a lot of new chemistry,” he says. “We’re trying to understand the machinery that nature uses to put these molecules together,” Crews says. “So this has sent us in yet another direction.”

Despite the diverse ways in which new biological activity continues to emerge, Crews is never likely to stray far from his first love, organic chemistry. In fact, he is currently deeply engaged in writing the second edition of his textbook, Organic Structure Analysis. By staying at the forefront of new techniques for exploring developing a broad range of interdisciplinary collaborations, Crews has managed to develop a program that effectively combines the scientific research. Biomedical researchers are already exploring the novel chemistry Crews has found in sponges and other obscure organisms. “I think we have only begun to tap into the full potential of his lab’s repository,” Crews says. “There are millions of compounds in his repository,” Holman says. “Phil has begun to scratch the surface in terms of the potential benefit to mankind.” —Tim Stephens
came pregnant before she was 20. But these factors, which might have held her back, have instead become motivations for success. “My parents always encouraged...tion was recognized this year when she was among 15 students to win a $2,500 Alumni Association Scholarship Fund (AASF) award. Thirteen additional undergraduates are receiving $1,500 this year while in their second or subsequent year as Alumni Association Scholars. For more information, call Jennifer Wood, UCSC’s director of development for the annual fund and colleges, toll free at (800) 933-SLUG.

JOHN LAIRD (Stevenson ’72) won election to the California Assembly from the 27th District this past November. Laird will represent Santa Cruz, the coastal counties of Monterey, Big Sur, and Morgan Hill. Laird had served as mayor and city council member in the city of Santa Cruz and most recently was on the Board of Trustees of Cabrillo College.

Alumni are invited to Banana Slug Spring Fair campus open house on Saturday, April 12. Activities include alumni reunions, lectures, performances, panel discussions, and tours. Highlights are listed below. For information or to RSVP, contact the Alumni Association at (800) 933-SLUG or go to the web site at alumni.ucsc.edu.

Alumni events:

- All-Alumni Reunion Luncheon. Reconnect with old friends at RSSF’s largest event. Classes of ’73, ’78, ’83, ’88, ’93, and ’98 will re...event. Alumni can invite a favorite faculty member to join them for lunch. Check the web site for details.

- Provost’s Reception. The college will hold late-afternoon receptions for alumni, faculty, and staff, generally at the provost’s home. Kreges will honor Alumni Association award winners and present Commendation Awards. Alumni are encouraged to occur short photo albums for...resents volunteers. The group is also seeking a “rap the roof,” send digital photos and favorite song titles to the Alumni Association at alumni@ucsc.edu.

- Thirty-Year Reunion of the Class of ’73. Celebrate at Cornell Dining Hall with a reception, dinner, and “roast” of the year 1973. Reconnect with old friends and fac...and interest group. The society offers scholarships, mentorship, and outreach to support the educational aspirations of foster youth, wards of the court, and orphans, giving particular attention to those enrolled at UCSC.

- The RSSF Distinguished Faculty Lecture will be presented by Adrienne Zihlman, professor of anthropology, an eminent teacher and scholar of evolutionary theory, primate and human evolution, primate behavior and anatomy, and the role of women in hominid evolution.

Scholarship winners present a change for the better, but the lack of...class to time with space. And that’s the least of her accomplishments.

Saldoco’s attendance at UCSC defies expectations. Her parents im...oj from Mexico with dreams of a better future, but their lack of education and limited English kept them working in fields and canneries. Saldoco’s childhood was marked by poverty. She married and be...came pregnant before she was 20. But these factors, which might have held her back, have instead become motivations for success. “My parents always encouraged education because they didn’t want us kids to have the kind of life they were living. They’d come home aching from work and tell us, ‘Study, so later in life you won’t have to be so tired like we are.’ I am determined to finish school to make my parents, husband, and daughter proud of me,” Saldoco says. Her goal is to become a social worker and work with children who’ve experienced domestic abuse. Saldoco’s commitment to education was recognized this year when she was among 15 students to win a $2,500 Alumni Association Scholarship Fund (AASF) award. Thirteen additional undergraduates are receiving $1,500 this year while in their second or subsequent year as Alumni Association Scholars. Donations to the AASF are welcome. For more information, call Jennifer Wood, UCSC’s director of development for the annual fund and colleges, toll free at (800) 933-SLUG.

The strangest thing is how our memories are so vivid of our days at UC, but when we consider gaining in touch with old friends, we are afraid they won’t remember us,” writes Kristine Amodeo (Oakes ’94). “We shouldn’t worry. Amodeo, owner of Sierra Art Studio near Senora, California, knows from experience. She’s one of countless alumni who have reconnected with old friends since the Alumni Association launched its Online Community. “It was a wonderful surprise getting her e-mail out of the blue,” he says about hearing from a Family Student Housing pal. “Since then, we’ve been catching up. They’re all grown so tall!”

Chicago-based marketing and communications executive Bob Moore (Stevenson ’70) had lost track of his old friend Buzz, who’d moved to Thailand in the mid ’80s. “He’d completely disappeared,” Moore says. After reading about the Online Community, Moore went to the site’s alumni directory feature, “typed in his name, and bam! There he was, with an address in the San Francisco Bay Area. No e-mail, no phone, but I wrote to him immediately.” Buzz quickly responded. Finding his old friend "was a true emotional hit," he says. Freelance illustrator Michael Wertz (Perret ’50) used the Online Community and found lots of current information and—best of all—e-mail address. I hooked up with Bill Kellman, with whom I hadn’t communicated since high school. We met each other in about five or six years. She’s linked with some of my fondest Santa Cruz memories. We go sailing on the huge tree stump in the Porter quad and make interesting food concoctions out of all-you-can-eat at Saga. It was great to see her again.”

The Online Community offers password-protected contact information for over 50,000 UCSC graduates, more than 5,500 of whom have directly personalized and updated their records. Gradls can customize home, business, and e-mail contact information they like to share. They can even post a photo of themselves. The multi-faceted Online Community web site offers an alumni directory, reunion posting and business-card exchanges, class notes, an Alumni Association events calendar, web pages for regional and affinity groups, membership opportunities, and much more—all free to UCSC alumni.

Log on to the Alumni Online Community (alumni.ucsc.edu) today and look for old friends. As Wertz puts it, “We’re both a bit older now (obviously) and our hair is no longer dyed black, but the connection’s still there.”
whose mother was singer Minnie Riperton. One of Riperton’s hits, “Lovin’ You,” was a lullaby for her daughter. Sadly, Riperton developed cancer at an early age, and died when Rudolph was not quite 7 years old.

That lightness has been on display not only on Saturday Night Live. “They were such good parodies. She toured the United States and Europe with Donatella Versace (Maya Rudolph)—her microwavable “Versace Pockets.” Not that the designer appears to be her when I grew up,” recalls Rudolph. “It was just one of those things where I thought ‘I want to do that when I grow up; I want to do that when I grow up’—and the feeling never went away.”

A character much closer to Rudolph is Megan, the gawky co-host of the school-based show, Wake Up, Waffleland. “That’s really fun—and it’s so depressing to laugh,” says Rudolph. “I think we do things to ourselves, but that’s just us laughing.”

That lightness has been on display not only on Saturday Night Live, but in various film roles. In Rudolph’s latest movie, she plays Drew Barrymore’s friend in a movie that actually is serious. She enjoyed working with the film’s stars and director Danny DeVito, but isn’t sure what the finished product will look like. “They had me come in and let me do a bunch of different things, so I actually don’t know what’s going to be in the movie.”

Rudolph’s experience with hands is limited to the Saturday Night Live parodies. She toured the United States and Europe with “The Rent Bag band after graduating from USC.”

Music—parody or not—has always come easily to Rudolph, whose mother was singer Minnie Riperton, and whose father, Dick Rudolph, is a songwriter. “I used to go to the road when we were really little, before we had to be in school. So I was always raised around music,” she recalls. “Music was always in my house—it’s always been in my head, and it’s probably the place where I feel the most comfortable if I’m doing a sketch for the show.”

One of Riperton’s hits, “Lovin’ You,” was a lullaby for her daughter. Sadly, Riperton developed cancer at an early age, and died when Rudolph was not quite 7 years old, a shock that Rudolph thinks caused her to “probably pushed me to find more lightness. I’ve always been the kind of person who likes to make people laugh, but I think that’s probably where I always have been a ham,” she says. “But I think when something like that, that’s so out-of-control, happens in your life—I mean especially when you’re a little kid—you definitely try to find ways to laugh, find ways to laugh. I think a lot of comedians feel that way. We take things so serious and it’s so depressing to laugh, that we just stop to laugh.”

Live from New York, it’s...Maya Rudolph!

Maya Rudolph—B.A. Art (photography), Paracer College, ’95—keeps SNL audiences in stitches with her身边 being her when I grew up,” recalls Rudolph. “It was just one of those things where I thought ‘I want to do that when I grow up; I want to do that when I grow up’—and the feeling never went away.”

A character much closer to Rudolph is Megan, the gawky co-host of the school-based show, Wake Up, Waffleland. “That’s really based on my own life, anyway. junior high, unloved, unequipped.” Describing the Saturday Night Live creative process as a “completely free,” Rudolph says that all the cast members do considerable writing as well as performing. Rudolph’s musical parodies, which she describes as a “guilty pleasure,” are especially popular. In one recent parody, she and cast member Ana Gasteyer portrayed the singing group Destiny’s Child—as Gemini’s Twin. “That stuff is too ripe for parody that it’s really fun to do. We get to make music videos, and wear the most stupid costumes you’ve ever seen.”

“Destiny’s Child even joined Rudolph and Gasteyer on Saturday Night Live. They were such good sport about wanting to play along with the whole thing,” said Rudolph. “It’s all about being stars, and she just<A  little girl in the late 1970s, Maya Rudolph begged her parents to stay up late to watch her favorite show. Saturday Night Live. As a 5-year-old wowed her Los Angeles family with impersonations of Roseanne Roseannadanna—one of Golda Rudolph’s signature characters—is living her childhood dream as a Saturday Night Live cast member. Rudolph revisits characters to an eclectic mix of characters—from fictional high school Megan to high-powered presidential adviser Condoleezza Rice to over-the-top fashion designer Donatella Versace. And through this it’s third full season with the show, she’s ‘still kind of shocked’ at the way things have turned out. ‘This show is a forum that allows me to get out all these things I want to write and perform—for me it’s the greatest job in the world,’ says Rudolph, who joined the cast after being spotted by a Saturday Night Live writer while working with the improvisational Groundlings Theater in Los Angeles. “I have all these great ideas, but they’re going to be so hard to bring to life.”

Rudolph says most of her characters have a great need to be accepted and loved—and that’s why they’re there. Donatella. She gets away with murder, Rudolph notes. “We’ve created a character based on a politician at this point—it’s so ironic, it doesn’t even translate into normalcy anymore.”

Not that the designer appears to be a politician at all. “I spoke to Donatella recently. She really liked it, which made her really happy, but she also kept giving me pointers, like, ‘If you’re going to do me, you can’t wear fake diamonds,’ things like that.”

A character much closer to Rudolph is Megan, the gawky co-host of the school-based show, Wake Up, Waffleland. “That’s really based on my own life, anyway. junior high, unloved, unequipped.” Describing the Saturday Night Live creative process as a “completely free,” Rudolph says that all the cast members do considerable writing as well as performing. Rudolph’s musical parodies, which she describes as a “guilty pleasure,” are especially popular. In one recent parody, she and cast member Ana Gasteyer portrayed the singing group Destiny’s Child—as Gemini’s Twin. “That stuff is too ripe for parody that it’s really fun to do. We get to make music videos, and wear the most stupid costumes you’ve ever seen.”

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and Intel, and is now consulting, teaching, and writing.

Bill ALLANUK is the state legislative director for Sierra Club California. The former vice president at Pennsylvania State University, NONUMORA is in a Montbello Scholar, holder of master’s and doctoral degrees from UC Berkeley, is a Dow Chemical Co. criminal defense attorney in a large Denver law firm. He has been a Harvard University officer. After 25 years in various marketing positions, David LINN is teaching business full-time at a local community college; he has a daughter in college (UCSD) and another in high school; his wife facilitates group meetings and church activities. AMY TERSOLO is living in Pacific Grove, working as a wildlife photojournalist, and helping start the Monterey Bay Council for Sustainable Communities.

Mike BROWN recently turned 50 and celebrated by hiking Mt. Whitney; he continues to do research in fisheries ecology. He has recently published an edition of the Journal of Industrial Ecology, and is still able to surf with his three sons.

Carla MARCIA WALKER recently purchased a home in the French Quarter of New Orleans, LA. She is now a research assistant at the University of Alabama, Birmingham, studying renal physiology.

Jennifer DEAN is teach a combination sixth-seventh-grade class, and she loves her job.

Merrill College

Ric SHAFFER has been a lawyer, entertainment executive, teacher, and consultant in the music industry for 27 years. He is a member of the recording industry hall of fame.
works at SeaWorld as an animal-care specialist. As a participant in the Bay Area Minority Summer Clerkship Program, she graduated in 2000 with a B.S. in agroecology, sustainable land use, the impacts of ecotourism, and the development and management of protected areas in the State of Quintana Roo. She married Alexander Evans in March 2002, and they are in the process of launching A & H Selections, a company that will bring Italian food merchandising to the public.

she was given the Crystal Bowl Award at the 33rd annual volunteer recognition luncheon of the Junior League of San Jose for her freelance volunteer work for Hospice of the Valley. Although her 2000 business degree was accepted for publication and will be released in June 2003 as part of the Tempestum Law Review, she made the decision to pursue a law degree with the goal of promoting world peace through the arts. She is taking a year off to travel the world, picking up hitchhiking at the Porta bus stop in 1994; she is a social worker and has recently begun a job teaching social work and applied sociology at Ithaca College.

Oakes College

Rachel ANNE GOODMAN is an assistant professor of English at SUNY Oneonta, is the editor of a new book from Rutgers University Press titled Getting Read: New and Notable First Nation Photographs and Native North American Art. She has been named chancellor of the University of the State of Quintana Roo.

Dale HATHAWAY graduated in 1991, and her goal is to promote world peace through the arts. She is doing his master's degree in K–12 art.

Joe JORDAN, a one-year-old and are living in the Bay Area; she is enjoying work combining sustainable development and technology, which includes other UC and UCSB alums, serving in Mauritania, West Africa, where she works on women’s health projects, she is currently living in Oakland.

Crystal BOCOM is serving with AmeriCorps/VISTA in Boston, where she is volunteering with ReadBoston, the city’s early literacy program.

Sarah YOUSSEFI married in 2002, and their son, Alexander Evans, has been named chancellor of the University of the State of Quintana Roo.

Graduate Studies

David Neal MILLER (Ph.D., literature) writes that his beloved wife, Marcy J. Miller, succumbed to breast cancer; he is director of Yiddish and Ashkenazic Studies at Ohio State University and is currently pursuing research on Yiddish literature.

Susan GRAY (Kresge ’88), a one-year-old and are living in the Bay Area; she is enjoying work combining sustainable development and technology, which includes other UC and UCSB alums, serving in Mauritania, West Africa, where she works on women’s health projects, she is currently living in Oakland.

Kevin KRESGE (Kresge ’81) has a son, Kevin T. Kresge (Merrill ’00) got a new glaucoma drug in fall 2002. He has been named chancellor of the University of the State of Quintana Roo.

San BERNARDINO (M.S., conservation biology) has been named chancellor of the University of the State of Quintana Roo.

Nosh photography and Native North American Art. She has been named chancellor of the University of the State of Quintana Roo.

In Memoriam

Dale HATHAWAY (Merrill ’82), a political science professor at Butler University, died May 22, 2002, in Florence, Italy while leading a student tour group.

Susanna SHINER (Crown ’93), a sonar engineer employed by Search, Survey and Recovery, Inc., and Lara Myachapina@yahoo.com, has taken a teaching position at the University of the State of Quintana Roo.

Carolyn HATCH (Merrill ’82), a sedimentologist and limnologist of the survey ship DISCOVERER, died June 25, 2002, in San Francisco. She has been named chancellor of the University of the State of Quintana Roo.

Raul RODRIGUEZ (Crown ’93), a sonar engineer employed by Search, Survey and Recovery, Inc., and Lara Myachapina@yahoo.com, has taken a teaching position at the University of the State of Quintana Roo.
Meg Zweiback (Merrill '69) and Tom Weiner (Stevenson '70) reconnected at their 30-year UCSC reunion through the UCSC Alumni Association. 

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