EXCEL
News For & About University of Florida Graduate Students

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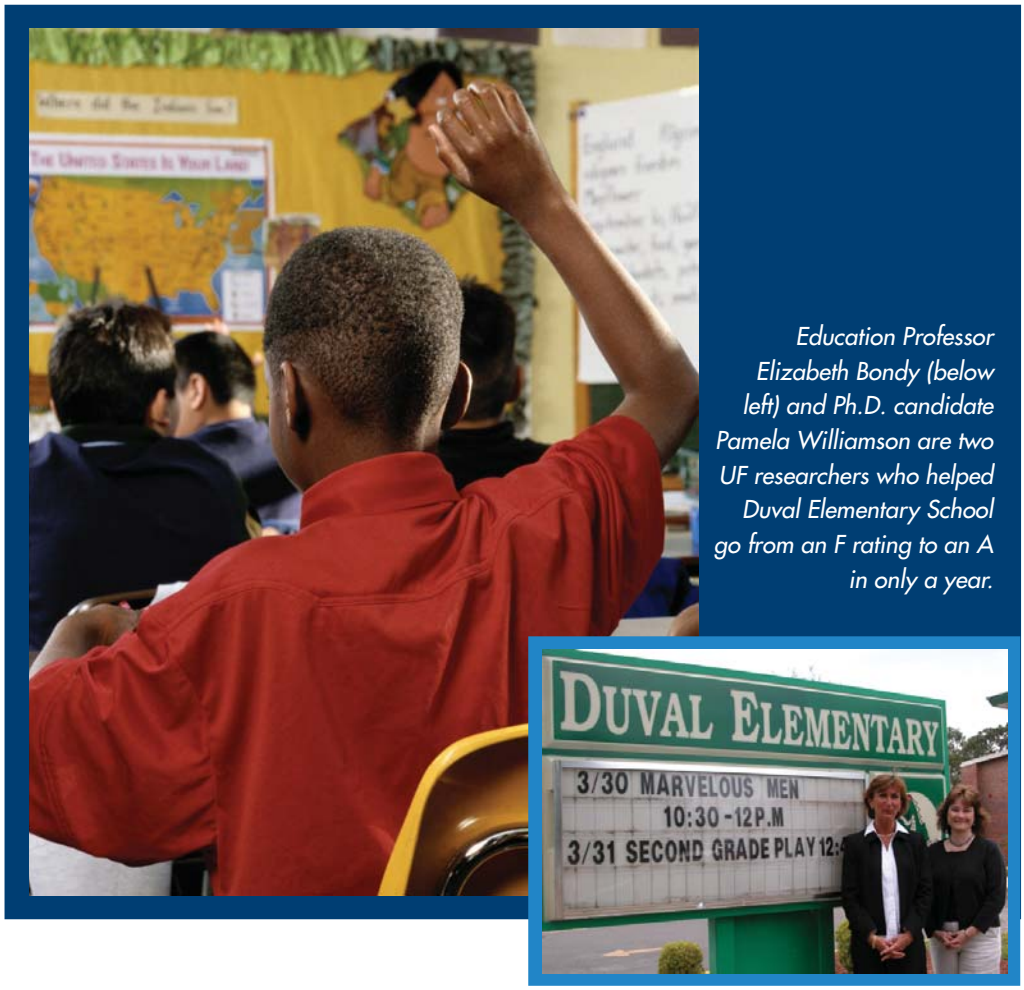


Education Professor Elizabeth Bondy (below left) and Ph.D. candidate Pamela Williamson are two UF researchers who helped Duval Elementary School go from an F rating to an A in only a year.

Education doctoral student helps failing school turn around

During her first three years pursuing a doctorate in special education, Pamela Williamson has gotten to witness firsthand the changes that can be achieved at a school with a plan for academic excellence.

Williamson was part of a team of university-based educators, lead by education Professor Elizabeth Bondy, that collaborated with Gainesville's Duval Elementary School to improve the school's grade from an "F" in 2002 to an "A" in 2003, as rated by the state's Department of Education.

Like many urban schools, Duval has a high percentage, more than 90 percent, of students on free or fee-reduced lunch. Also, almost half of the students move in or out during the year, and high levels of mobility are common in other failing or low-scoring schools, Bondy says.

"Teachers are learning new and different ways to look at children with disabilities in their classroom. They're exploring issues near and dear to their own heart and finding ways to remedy those issues."

—Pamela Williamson

After the disappointing results in 2002, Bondy — who has been Duval's professor-in-residence since 1999 — and the school staff reevaluated what was working and what wasn't.

One approach was to study teachers whose classes had performed well on the FCAT. The team observed two teachers, one in fifth grade and one in third grade whose students performed very well on the FCAT.

"Pam helped with interviewing, observing, data analysis of pages of field notes, and interviews," Bondy says. "There were many sources of data, from teacher interviews to classroom observations. It was messy, but fascinating, data and from that we've been able to get portraits of good teaching."

Williamson says she was fascinated by how the best teachers engaged their students.

"There was a rhythm to the classroom. The teacher wasn't using a textbook, she was up at the board, having children memorize and apply information," Williamson says. "It was amazing how quickly they responded to the questions. There was excitement in the classroom."

Williamson — who will graduate in May 2006 and hopes to become a special education professor — is also working on a project called Duval Fellows, a year-long professional development program that the teachers help to create. The program encourages special education teachers to pursue new strategies for children with disabilities in their classrooms.

Bondy and Williamson meet with about 30 teachers, guidance counselors and administrators for three hours each month to discuss concerns and strategies.

"Each teacher has to name some insight they've gained since the last meeting," Williamson says. "Teachers are learning new and different ways to look at children with disabilities in their classroom. They're exploring issues near and dear to their own heart and finding ways to remedy those issues."

Williamson and Bondy say the broader benefit of the research they have done at Duval Elementary is that it can be applied to many similar schools in Florida and elsewhere.

"Hopefully, I'll be able to share information I've learned," Williamson says.

Tools of Play

Doctoral student Jamie Waters explores evidence of children in Florida's spanish colonial villages

Digging into the past is more than child's play, says UF anthropology doctoral student Jamie Waters, whose archaeological finds of children's artifacts reveal missing clues about the world they lived in.

Children in 18th-century Spanish colonial households in St. Augustine had toys and games, but they also started early to learn their future roles as men and women, the study reveals.

"The main goal of childhood was to get children ready for their adult lives," says Waters. "Parents and other adult family members were trying to socialize children in the skills they would need as adults, which for boys included reading and writing, and for girls was domestic crafts, such as pottery making, sewing, cooking and taking care of younger siblings."

Boys were left relatively free to play between the ages of 3 and 7, before entering school, while girls were beginning to be taught the future responsibilities of motherhood, food preparation and other household tasks, Waters says. Thimbles and small ceramic bowls found at the site were among the items young girls used, she says.

Waters, a research assistant to renowned UF archaeologist Kathy Deagan, compared the artifacts from four households known from documents to have between four and nine children with those from other households, three without children and one with one child.

The artifacts were collected during excavations headed by Deagan and by other archaeologists in excavations in the 1970s.

To identify each household, Waters used a 1764 map commissioned by the Spanish government to assess property holdings of the colonists. She was able to determine family size by examining parish records for births and baptisms. Other records revealed payroll amounts for the garrison, allowing her to compare the number and types of artifacts associated with children living in lower- and upper-class households.

Marbles, spinning tops, whistles and miniature ceramic figurines such as animals and birds that were excavated from households with children, she says.

Jamie Waters examines a carved bird that might have been used as a toy in 18th-century Spanish colonial households in St. Augustine, Fla.

"Despite the fact that St. Augustine was considered an impoverished and remote garrison town compared to the rich and cosmopolitan cities of Mexico City or Lima, it appears that families still acquired amusement items for their children," Waters says.

"Children seldom have been explored in archaeology because of the limited Western view of childhood as merely a prolonged period of dependence on adults," Waters adds. "Yet our research shows that children clearly have been and continue to be important parts of our culture."

Amoebas detect water quality in North Central Florida's Lakes

Master's student Jaime Escobar conducts groundbreaking research

"Florida has more than 7,000 lakes, so it's key to know the quality of their water,"

— Jaime Escobar

Colombia's Escuela de Ingeniera de Antioquie is a long way from the University of Florida. But for Jamie Escobar, a master's degree in geological sciences was a natural progression from his bachelor's degree in environmental engineering.

"When he came to UF, Jaime had a clear idea of exactly what he wanted to do, the organisms he wanted to work with and he took it upon himself to design a good research topic, thesis, and to do it on his own," says Mark Brenner, associate professor of geological sciences.

Escobar studies testate amoebas (amoebas with a shell) found in lake sediment to determine water quality. He has applied this method to 35 north central Florida lakes.

"In a lot of ways, his research is groundbreaking because very little work has been done with these organisms," says Brenner.

The amoebas are useful as indicators of whether a lake's water is acidic or alkaline, Escobar says, and they act as indicators of nutrient levels in the lake.

"Depending on the kind of amoeba I find in the lake, I can tell the water quality," he says.

Escobar, who graduates in spring 2005, will continue his research at the doctoral level.

"I'm hoping to develop mathematical models based on the amoebae to relate the distribution of the different species in each lake with environmental conditions of each lake," Escobar says. "It's ongoing research."

Brenner says Escobar's research is two-fold.

"It tells us about contemporary water-quality issues and gives us an eye to the past in terms of trying to reconstruct changes in water quality," he says.

"Florida has more than 7,000 lakes, so it's key to know the quality of their water," Escobar says.

Lake Kissimmee, 15 miles east of Lake Wales, is just one of Florida's 7,000 lakes.

Manatee Bone Property Helps Define Safe Boating Speeds

Manatees ascend to the surface to get air about once every five minutes, which often puts them in the path of one or more of Florida's 900,000 boats. Each year, collisions with boats account for about 25 percent of roughly 300 manatee deaths in Florida.

With an eye on the speed restrictions the state imposes on selected waterways to try to protect manatees, doctoral student Kari Clifton is studying the properties of manatee bone.

As with so many of the manatee's other attributes, the structure of its bone is unusual, Clifton says. The rib bones in particular are extremely dense and heavy. It is thought these heavy ribs provide ballast for the manatee like a weight belt for a scuba diver.

Kari Clifton

"Manatee bones are solid and highly mineralized so they're extremely heavy," says Clifton, who will graduate in December. "But they're actually quite brittle; it's not a surprise to engineers, but most people don't realize that it takes very little energy to break their bones."

In fact, the bulk of deaths due to boat collisions do not result from propeller cuts but rather from trauma and broken bones, Clifton says.

To determine just how much force it takes to break manatees' rib bones, Clifton, who got her undergraduate degree in biology from Valparaiso University in Indiana and came to UF in 1998, fired projectiles at bones from dead manatees and measured how much energy it took to fracture them.

Clifton's study represents the first attempt to measure the biomechanical effects of boat strikes on manatees.

"The best part was doing the impact testing because it gets us closer to the ultimate goal," Clifton says. "Now, we can say how fast the boat needs to be going to prevent those fatalities. We produced data that can actually be applied in the real world."

Independence Drive

National Older Driver Research and Training Center helps fuel Senior independence

When Dennis McCarthy signed on to be a research assistant in the rehabilitation science doctoral program in 2002, he had no idea he would soon be co-director of UF's National Older Driver Research and Training Center.

The center, in the College of Public Health and Health Professions, is the nation's only center dedicated exclusively to older drivers. It is supported by nearly $2 million in funding from the Centers for Disease Control and Prevention, the Federal Highway Administration and the State of Florida.

McCarthy, who earned a bachelor's degree in occupational therapy from Florida International University and a master's in education from Florida Atlantic University, says his work as an occupational therapist focused on the use of adaptive equipment and technology to help elderly patients maintain their independence.

"This is really an extension of that, looking now at the automobile," McCarthy says of his current research. "People depend on their cars, so when they're no longer able to drive, we see what we can do to allow them to remain connected to their communities."

The United States currently has more than 18 million drivers aged 70 or older and by 2024 an estimated one in four drivers will be 65 or older.

The center has several projects geared toward elderly driving independence.

Center researchers are working to determine which methods are best for evaluating seniors' driving abilities and if roadway design features might affect safe driving performance. The data are being gathered from the center's assessment programs in Gainesville and Ocala, as well as collaborating sites in Jacksonville and Orlando.

Vision problems, cognitive deficits, physical limitations, and even some medications, can contribute to difficulty driving as people age.

Dennis McCarthy
College of Public Health and Health Professions

The center's assessment program, Independence Drive, offers two-hour evaluations that include physical, vision and cognitive testing and assessments of on-road driving skills. Individuals found to be unsafe drivers are counseled and educated about alternatives to driving. Information about the program is available on the center's Web site, independencedrive.phhp.ufl.edu.

"It's not only getting the word out to elderly drivers, but to healthcare professionals in the field that there are places where clients with questions about driving ability can be addressed," McCarthy says.

After he graduates in August 2005, McCarthy says he hopes to continue research on older drivers and alternatives to driving that allow older people to maintain their mobility.

Center For Children's Literature and Culture Remembers Childhood

Sometimes graduate school can can take one back to childhood.

For Lauren Brosnihan, a graduate student in UF's English Department, children's culture — from ancient lullabies to animated films, from fairy tales to the latest toy — is at the forefront of her mind.

Since Fall 2002, Brosnihan has worked with UF's Center for Children's Literature and Culture, helping English Professor John Cech to produce the center's public radio program, *Recess!* The daily, three-minute show reaches an estimated audience of 20 million listeners from coast to coast, and even more internationally through it's website www.recess.ufl.edu

Lauren Brosnihan

"Lauren produces, writes and voices programs for *Recess!*; she answers inquiries about the show; and she maintains the *Recess!* website and its text and audio archives," Cech says.

"Through the show, we're trying to help adults to become more aware of children's culture by looking at music, art, books, media, and issues that deal with childhood," Brosnihan says. "Our goal is to offer our listening audience of primarily adults three minutes during which they can pause in their daily lives — at home, in the car, or at work — and think about childhood, past and present, and its vital importance in our lives."

Brosnihan also helps to organize the colloquiums that are held annually by the center to discuss such subjects as the changing nature of children's libraries and innovative ways to introduce children to science.

"The colloquiums offer diverse ways of looking at these subjects," Brosnihan says. "They're really for anyone who's interested in children's education including teachers, librarians and media specialists, policy-makers, and scholars. These meetings are free and open to the general public."

Brosnihan earned a bachelor's degree in humanities from Providence College, a master's of library science from the University of Maryland and a higher diploma in Anglo-Irish literature from Trinity College in Dublin, Ireland.

Brosnihan, who was a librarian at the University of West Florida for seven years, says the strength of the English faculty was the draw to pursuing her doctorate at UF.

After she earns her doctoral degree, Brosnihan says she hopes to teach at a liberal arts college, incorporating children's culture into the courses she will be teaching.

Student Uses Isotopes To Track Loggerhead Sea Turtles

Kimberly Reich holds a juvenile loggerhead, raised on campus as part of the lost-year study baseline work.

Throughout the nearly 50 years renowned University of Florida naturalist Archie Carr spent studying sea turtles, personal observation was his most valuable research tool.

Today, UF doctoral student Kimberly Reich is measuring stable isotopes in loggerhead sea turtles to help answer questions about which Carr could only speculate.

Isotopes are forms of a chemical element that have different numbers of neutrons and therefore different atomic masses. Stable isotopes are naturally occurring isotopes that do not decay with time, and include isotopes of hydrogen, oxygen, nitrogen, carbon and sulfur.

Stable isotopes are valuable to science because their abundance in nature varies in a predictable manner by geographic location and by the type of biological material sampled. Stable isotopes can be used to infer habitat use and diet of animals that are otherwise hard to follow. So, by measuring stable isotopes in skin from nesting loggerheads, Reich can infer where nesting females spend their time.

"Because the turtles only nest once every two or three years, it's difficult to observe them." Reich says. "They end up spending the bulk of their lifetime somewhere else. Knowing where that is affects our ability to protect them, not only during migration, but in their feeding grounds."

Reich studied loggerheads for four summers as an undergraduate at Palm Beach Atlantic University in West Palm Beach before studying isotopes in the Department of Wildlife and Fishery Sciences for her master's degree at Texas A&M University. She began her doctoral studies at UF in 2001 and will graduate next December.

Reich has mentored 12 undergraduate students during her four years at UF and plans to go into academia after graduating.

"I enjoy watching students get excited about science and develop an interest in something that was foreign to them before," Reich says. "Two of my students presented posters at a national symposium this year and a number have gone on to graduate school. It's nice to be able to reciprocate that mentoring I had from professors as an undergraduate."

Photo by Douglas David Seifert

Homes Hit By Hurricane Winds Offer Insight To Better Building

When UF civil engineering master's student Rob Davis signed on to do hurricane-related research in the summer of 2004, he had no idea how relevant it would be.

"I didn't have any idea what we were going to be hit with, but found myself in the right place at the right time," Davis says.

Hurricanes Charley, Frances, Jeanne and Ivan provided plenty of opportunity to evaluate the performance of homes affected by hurricane-force winds.

Davis and other researchers in the Florida Coastal Monitoring Program are surveying hurricane damage to single-family homes in the highest wind-speed zones. That means Punta Gorda and Port Charlotte for Hurricane Charley, Fort Pierce and Port St. Lucie for Hurricanes Frances and Jeanne, and Pensacola for Hurricane Ivan.

The homes are randomly selected and compared with property appraisers' data and a map of wind speeds. The team has surveyed about 150 homes so far, conducting structural inspections of the exterior and interior of the home and logging the information into handheld computers.

"I have an aerospace background and worked with low-speed aerodynamics, so when (UF associate professor of civil engineering) Kurt Gurley saw my resume, he thought I'd be interested in this kind of research," says Davis, who received a bachelor's degree in aerospace engineering from Auburn University.

The researchers hope that by correlating damage with wind speeds, building codes can be improved to lessen future hurricane damage.

After graduating in spring 2006, Davis hopes to become a licensed structural engineer in Florida.

"The most exciting part is getting to meet the individual homeowners and hear their evaluation of the hurricane, personal experiences and reaction to the storm," Davis says.

This stucco home endured some of Hurricane Ivan's strongest winds

Rob Davis, master's student in the Department of Civil & Coastal Engineering

Hurricane Ivan ravaged Pensacola in late September 2004

Ph.D. Mentors for 2005

Each year the Graduate School recognizes five faculty members for excellence in mentoring doctoral students with the Doctoral Dissertation/Mentoring Award.

A committee of faculty and students chose this year's recipients from among more than 200 eligible faculty across campus. Nominees are required to have served as a committee chair or co-chair for at least one doctoral or MFA student in the last year and at least three in the past five years.

Each of the faculty members receives $2,000, plus an additional $1,000 to support graduate students.

JANE BROCKMAN
Professor of Zoology
College of Liberal Arts and Sciences

Jane Brockmann says she was "predestined" to follow a career in science. And for nearly 30 years, she has mentored UF zoology graduate students who have felt the same.

"Jane's sheer irrepressible and boundless enthusiasm for science and biology greatly inspired and motivated me during moments of doubt in my graduate days and allowed me to step back and appreciate why I was engaged in doing a dissertation in biology," says Kavita Isvaran, one of Brockmann's former doctoral students who is now on the faculty at Cambridge University in England.

Several current and former students and colleagues cite Brockmann's communication skills as a key to her mentoring success.

"Dr. Brockmann has extraordinary communication skills," says Laura King Sirot, who recently received her doctorate under Brockmann. "She is completely forthright with her students without ever making them doubt her support for them."

Brockmann says many students believe that data collection is the hardest part of the dissertation process, but she says analyzing the data, thinking deeply about the results, working through the best organization for the manuscripts and writing effectively is always a new and separate challenge.

"In many cases I feel that I do little more than read, listen, ask questions, react to ideas and propose alternatives," she says. "At some point, however, I begin to hear my students asking my questions, reacting to their own ideas and presenting their results in an organized way."

Brockmann says students especially need mentoring when they are choosing their research project.

"There are certain points when an advisor is especially crucial," she says. "With each student I try to balance close supervision with independence and critical evaluation with supportive encouragement."

PAUL HOLLOWAY
Distinguished Professor of
Materials Science and Engineering
College of Engineering

When the UF College of Engineering was purchasing equipment for its Major Analytical Instrumentation Center, or MAIC, Paul Holloway could have pushed for equipment that specifically benefited his research interests.

But instead he recommended instruments that would be useful in a broader range of materials science research, particularly the kind of research graduate students perform.

"He could have campaigned for equipment that would have been more focused on his own research interests," says Carl Meuller, who earned his doctorate under Holloway in 1992. "Instead, he made decisions that clearly put a higher priority on the students' education."

David DeVito, a graduate assistant and manager of Holloway's laboratory, says Holloway "allows his students to devise solutions to the problems they face in research while providing a guiding hand."

Department chair Kevin Jones notes that Holloway and his students have published more than 260 articles and proceedings together, "and in almost all of those papers, students are the first authors."

Holloway says encouraging students to publish "teaches the students a number of important lessons, including how to plan experiments, to meet a deadline, organize and interpret data, and develop their writing and presentation skills."

Holloway, who is internationally recognized for his work in thin-film polymers, says: "The greatest satisfaction a university professor can experience is the successful completion of the degree requirements of a student with whom they are associated."

James Jones

Professor of Agricultural and Biological Engineering
College of Agricultural and Life Sciences

Despite the fact that he has an extremely active research program, James Jones has advised more than two dozen doctoral and master's students who have gone on to successful careers in academia and industry during his more than 20 years at the University of Florida.

Jones develops computer models that seek to understand and predict the interaction between climate, crops, soil and management practices.

Jones integrates his students' interests with his own to achieve research and education success for both.

"My mentoring philosophy is guided by the fact that our graduates will function in an increasingly complex world in which interdisciplinary research and cooperation is essential for advancing science and its application to societal problems," Jones says.

"Dr. Jones is a fantastic mentor; a unique mix of teacher, cheerleader, CEO, and all-around role model," says R. Andrews Ferreyra, manager of biological applications at Ag Connections, Inc. "I will strive to imitate Dr. Jones' example for the rest of my professional career."

Former student Carlos D. Messina praises Jones for encouraging his students to pursue new areas of research.

"He learned along my side, he let me make mistakes while making sure I learned from them," Messina says.

Greg Neimeyer

Professor of Psychology
College of Liberal Arts and Sciences

Greg Neimeyer says that several years ago he saw an ad on television about parenting that equated well to his feelings about mentoring.

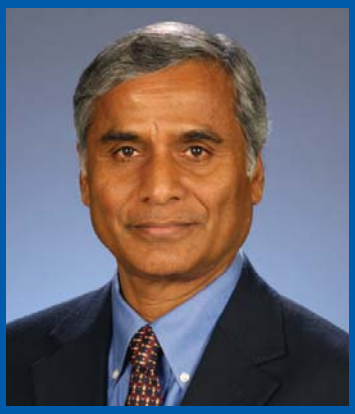
"In the ad the person was describing the experience of parenting as 100 times more challenging and 100 times more rewarding than anyone might imagine," Neimeyer says. "Mentoring is like that, too."

Neimeyer says that although he has served on more than 100 graduate committees, including more than 30 as a doctoral chair, during the last 20 years, the shear volume "seemed to be the least significant indicator of my experience as a mentor.

"Inside these numbers were individual stories to tell about lives that were led. The lifeblood of the mentoring process was better portrayed in those narrative accounts than in the collective numbers," Neimeyer says.

Indeed, several former students cited Neimeyer's listening abilities as key to his success as a mentor.

"I think one of Greg's greatest strengths as a mentor is his ability to listen attentively and support his students' creativity and individuality," says Teraesa Vinson, a former doctoral student. "Greg mentors an extremely diverse group of students with different ideas, interests and goals, yet he manages to focus on that individual and find the projects and paths that are best for that person."



Ramesh Reddy

Graduate Research Professor of Soil and Water Science
College of Agricultural and Life Sciences

Although Ramesh Reddy is a leading authority on biogeochemical cycles of nutrients and other contaminants in wetlands and aquatic systems, he expects his graduate students to be "smarter."

"I consider graduate students as my colleagues and expect them to bring new challenges and ideas to the program," says Reddy, who has served on 106 graduate committees. "I depend on them to be smarter and stay current with the published literature, while they depend on me for support and direction that helps them to function at their full potential."

Students often cite Reddy's paternal nature in overseeing their studies.

"While he maintains quite high expectations of his students, he is also fatherly in his approach to guiding students through the doctoral experience," says current student Todd Z. Osborne. "He takes extraordinary interest in our health and well being outside of the lab."

Reddy says he values the graduate education experience because of the long-term relationships he has developed with his students.

"Their accomplishments and success as young scientists gives me personal satisfaction that I played a small role in shaping their lives," Reddy says. "This is truly my reward."

Conserving Florida's Native Orchids One Petal At A Time

Scott Stewart says that when he tells people his doctoral dissertation research is on native Florida orchids, "they usually picture the kind sold at Home Depot," like exotic *Phalaenopsis* and *Dendrobium* hybrids.

All of Florida's 118 native orchid species are threatened by development, Stewart says, and while land acquisition is the primary way to protect them, he adds that other methods must be developed to propagate and restore orchid populations in the wild.

By studying many elements of orchid ecology, including distribution, population, genetics, pollination, mycorrhizae and propagation, Stewart hopes to "offer a complete picture of how Florida's native orchids fit into the greater ecosystem."

He has chosen three critically endangered native orchids as tests for his integrated conservation methods: *Habenaria distans*, the false water-spider orchid; *Habenaria macroceratitis*, the long-horned orchid; and *Spiranthes floridana*, the Florida ladies'-tresses.

"By developing integrated conservation and recovery plans based on research with these three species," Stewart says, "I hope to lay the groundwork for the conservation and recovery of other Florida native orchids."

Florida has more native orchid species than any other state, and while the commercial plant emphasis has been on exotic and tropical orchid hybrids, Stewart says more growers are producing native orchids for purchase as both potted and garden plants.

Pale Grass Pink (C. pallidus), is one of the more common roadside orchids in Florida.

The Orange crested orchid (Platanthera cristata) is a representatives of the yellow-fringed summer flowering Platanthera complex native to Florida.

He says orchids also are a draw for eco-tourists who come to Florida on "native orchid vacations" in places like the Fakahatchee Strand State Preserve, Everglades National Park and Apalachicola National Forest.

"Despite being in its infancy, this eco-tourist movement can only be supported if the state's unique native flora continues to exist in wild areas," Stewart says. "Florida's native orchid populations are under constant pressure from human population expansion and land conversion to agriculture and home sites."

Stewart's fascination with orchids developed early. He published several scientific papers on terrestrial native orchids while an undergraduate at Illinois College in Jacksonville, Ill., where he earned a bachelor's degree in biology and chemistry.

He came to UF in 2003 to pursue a doctorate in environmental horticulture under the guidance of Michael Kane, a professor in the environmental horticulture department.

"Scott has an incredibly infectious passion for the biology of endangered Florida native orchids," Kane says. "He has proven himself to be a very talented scientist who embraces both laboratory and field research."

Stewart, who plans on becoming a professor after graduation, says the most exciting part of his research is getting out of the lab.

Children With Autism Develop Friendships In Inclusive Classrooms

Florida has more than 5,000 children with autism-related disorders in its schools, and many are socially isolated because of their symptoms.

Brian Boyd, a doctoral student in special education with an emphasis in early childhood special education, has seen their struggles in the classroom first-hand.

"I used to teach autistic children," Boys says. "The biggest problem for them is socially relating to other people, especially kids their age."

Although friendship development is one driving factor behind the current trend in special education to integrate students with disabilities into the general school population, Boyd says autistic children have great difficulty establishing durable friendships.

So researchers at the University of Florida developed Project GATORRS.

"In Project GATORRS, we enter the classroom and assess kids with autism, then develop interventions for them and friendship formations with other students," Boyd says.

Project GATORRS conducts systematic assessments of children's social behaviors and develops individualized interventions that account for both the unique characteristics of the child and the classroom context in which social interactions occur.

The project uses a four-part model to link assessment to intervention. First, the researchers interview teachers and caregivers and observe children in the classroom to gain an understanding of how they interact with their peers. They also videotape students in a variety of social settings, such as snack time. Based on these assessments, the researchers develop hypotheses about the characteristics of the child and classroom that facilitate or inhibit social interactions.

Based on these hypotheses, the team develops experimental assessments to determine the factors that may be leading to inappropriate or withdrawn social behaviors. Finally, the researchers develop individualized interventions for each child.

Boyd earned a bachelor's degree in psychology from the College of William and Mary in Virginia and a master's in early childhood education at the University of Virginia.

"The most rewarding part of this research is working directly with teachers and families, and being able to facilitate the socialization of kids with autism to make their inclusive experience with other children more successful," Boyd says.

When he graduates in August 2005, Boyd will do a postdoctoral fellowship at the University of North Carolina at Chapel Hill.

"Hopefully what we are developing with Project GATORRS is an assessment model that teachers can use in classrooms across the state to help determine what will help autistic children be more social," Boyd says.

Brian Boyd

Gator Tech Smart House Makes Living Easy For Elderly

Jeff King is helping make houses for today's senior citizens look more like the Jetson's futuristic cartoon home at the Gator Tech Smart House.

The house melds the latest computer and sensor technology to provide automatically the assistance at home that many people need as they age.

Built into this cozy but complete living space is a mind-bending array of experimental assistive-living devices, ranging from a microwave that recognizes entrees and automatically determines how long to cook them to a "smart floor" that tracks an elderly person's whereabouts in the home. These devices are linked by a computer network and keep tabs on each other and, most important, the resident.

Computer engineering doctoral student Jeff King is part of a team that helped design "smart floor," and since November 2004 King has been deputy director of Smart House.

"Jeff is the perfect team player for a research and development team," says Sumi Helal, an associate professor of computer and information science and engineering and director of technology development for the UF Rehabilitation Engineering Research Center on Technology for Successful Aging. "He enabled many of the projects that he was not directly involved in, voluntarily, and stirred in a great sense of responsibility and pride among the rest of the research team."

King is also working on a system that will project a text or video image onto any surface inside the house.

"We're targeting senior citizens and people with hearing impairments who can't hear audio like a phone or doorbell," says King, who will graduate in December 2005. "It will allow them to read information they need to know."

Florida is especially in need of current assisted-care solutions. Nearly 9 percent of the state's population — about 1.5 million people — is 75 or older, the highest in the nation. The need is only increasing: the state's 85-plus population is projected to almost double by 2020, when Florida will be home to almost 650,000 people aged 85 or older.

Jeff King demonstrates smart wave, a microwave that recognizes and cooks prepackaged foods

"Usually, work in computer science helps machines run faster or have better graphics, but this project will directly improve peoples' lives in a permanent way," King says.

Techno Interiors

MODIA is a media server that allows voice-activated program recording and services

Smart Bed monitors sleepless nights and sleep patterns

Bridge Vs. Barge: UF Engineers Purposely Ram A Bridge To Learn How To Design Safer, Less-Expensive Bridges

St. George's Island Bridge in Apalachicola Bay was the site for the 2004 bridge-barge experiment

David Cowan has spent most of his graduate career at the University of Florida preparing to create a disaster.

In March and April 2004, Cowan was part of a UF research team that rammed a barge into the decommissioned, 1960s-era St. George's Island Bridge spanning Apalachicola Bay. These first-ever planned collisions culminated the experimental stage of a $1 million research effort four years in the making.

The preliminary findings suggest potential new ways to reduce the cost of new bridges — and better safeguard them against the rare but deadly accidental collisions that have cost dozens of lives in the past two decades.

With its 1,200 miles of coastline and lengthy Intracoastal Waterway, Florida is a hot spot for barges toting fertilizer, coal, petroleum products and other cargo. Florida has more than 9,000 bridges, including several hundred spanning bays or rivers deep and wide enough for barge traffic.

The threat of accidents results in significantly higher construction costs. State engineers design all bridge supports, or piers, to withstand major hurricane wind forces. But, for bridges in navigable waterways, engineers must design to far more stringent collision standards.

The bulked-up construction magnifies expense. Top hurricane wind loads on the Bryant Grady Patton Bridge that replaced the St. George's Island Bridge might have totaled 120,000 lateral pounds. But the higher standards protecting the bridge against collisions required that some of its piers could sustain 3 million pounds, requirements that at least doubled the bridge cost to $80 million.

These higher standards are based on limited test data, because before the St. George's Island experiments no one had ever run vessel collision tests on bridge piers at full scale.

As part of a team led by Gary Consolazio, an associate professor of civil engineering, Cowan and others installed dozens of sensors, including load cells, accelerometers, strain gauges and pressure transducers, on the barge and on the two piers the team planned to ram. Cowan and fellow civil engineering graduate student Alex Biggs assisted in the design, fabrication and installation of the sensor systems, Consolazio says.

"David and Alex were key contributors to the success of the project," Consolazio says.

The sensors aimed to measure not only on how much force the collisions generated, but also the bridge pier's movement and how the nearby soils responded.

The researchers are still crunching the many gigabytes of data they collected during the tests, but their initial findings indicate the maximum impact loads generated may be less than the design standards predict.

The reduced load, if confirmed, could ease some of the expensive construction requirements for collision-prone piers, Cowan says, and could result in safer bridges.

"I enjoy the analytical work," Cowan says, "but I also enjoyed being out there doing experimental tests on the bridge."

David Cowan (right) and the research team attached sensors to St. George's Island Bridge to monitor the barge's impact.

Graduate Education: A "Lifetime Experience" to Meet a Lifetime of Challenges

This issue of EXCEL focuses on graduate student research and its impact on the State of Florida. UF's 10,000 graduate students are involved in critical areas of research that have tremendous implications for Florida citizens — personally, socially and economically. From developing strategies to improve educational opportunities for disadvantaged children to creating "smart" houses for the elderly, UF's graduate students are making a difference for Florida.

Graduate students learn while doing. The close association between students and faculty mentors produces new knowledge while simultaneously training the next generation of scientists and scholars.

Science advances because discoveries in one discipline fuel ideas and new technologies in others. Comprehensive research universities like UF are able to transform ideas into discoveries and then into applications. UF faculty encourage students to acquire information from many disciplines and apply that knowledge to specific problems. Kari Clifton's study of manatee bones is a good example. She blended an understanding of biology, ecology, engineering and biomechanics with public policy and recreational practices to address a real problem in Florida. Thousands of other students are doing the same.

The challenges of Florida's future are the grist for the budding scientists represented in EXCEL. Their contributions are immediate and the skills they learn today will benefit the state tomorrow.

Kenneth J. Gerhardt, Ph.D.
Interim Dean

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