I'VE NEVER BEEN GOOD AT MATH!
Why Do Americans Think This Way?

COLLEGE OF SCIENCE ADVISING CENTER
Helping Students Succeed

WHERE'S THE BEEF?
All Saturated Fats Are Not Created Equal

Traveling Chem Students
Alumni Notes

STEP INTO THE BOD POD!

WHAT'S YOUR MUSICAL FIT?

Why Can't I Stop Eating?
a message from the dean

In this issue of our magazine, Progression, we continue to update the friends of the College of Science at Coastal Carolina University with a series of articles that illustrate the breadth of activities in our College.

It's important to note that many of the things you will read about in this magazine are made possible through support from readers just like you. Your financial commitment has a direct effect on the College of Science's educational mission. It allows us to purchase state-of-the-art equipment and supplies for our research labs. It enables us to recruit and hire the faculty who will provide lifelong opportunities for our students, and it supports student and faculty travel to academic conferences.

After you read the articles, I would encourage you to think about becoming a part of what we do. By making a commitment to the financial support of the college, no matter how small or large, you will help ensure that the activities you read about in this magazine become a reality for subsequent generations of students in the College of Science at Coastal Carolina University.

Please feel free to contact the College of Science's Gift Officer, Bryan Steros (bsteros@coastal.edu), to see how you can help continue our journey toward excellence. Of course, you are also welcome to contact me – my phone number and email are listed below; you can also follow me on Twitter: @CCUScienceDean

Regards,

Michael H. Roberts, Ph.D.
Vice President for Research and Emerging Initiatives
Dean – College of Science
e-mail: mroberts@coastal.edu
843.349.2282 • 843.349.2926 fax
DEPARTMENT OF MARINE SCIENCE

Jane Guentzel, Ph.D.
Department Chair

The Department of Marine Science currently enrolls approximately 800 majors and is one of the largest undergraduate marine science programs on the East Coast. In addition to undergraduate studies, the department interacts with CCU's Coastal Marine and Wetland Studies master's program and the newly emerging doctoral program in Coastal and Marine Systems Science. Marine science is an interdisciplinary field that uses biology, chemistry, geology and physical oceanography/atmospheric science in the study of the ocean. Lecture, laboratory and field experiences are integrated to provide an outstanding and well-rounded academic program. Within marine science, you may choose to concentrate your studies in one of the following areas: marine biology, coastal geology, marine chemistry, atmosphere/ocean dynamics or marine analytical technology.

With our ideal location near the coast and collection of research-active faculty committed to undergraduate and graduate education, our strength is in providing individual attention and hands-on opportunities for students. Some of these study opportunities include offshore wind energy, the development of hypoxia in the coastal zone of Long Bay, S.C., mercury cycling and bioaccumulation in aquatic plants, the development of genotypic tracers of pollution sources for S.C., population structure and feeding ecology of sharks in S.C. estuaries, foraging interactions between birds and bottlenose dolphins in S.C. salt marshes, coastal salt marsh ecology and oyster reef restoration.

As a marine science major, you are encouraged to get involved with research or internship experiences, which can help you get into graduate school, get a job or make contacts within the discipline of marine science. Each year, many of our students work individually with faculty to complete semester-long independent research projects or internships for credit. More than half of these students present their findings at state, regional, national and international scientific conferences.

Two major national reports, the Pew Oceans Commission and U.S. Commission on Ocean Policy, have documented the critical importance of marine science to our national health and well-being and called for increased efforts in marine science education, research and funding. This is truly an exciting and dynamic time.

Please visit the Department of Marine Science website at coastal.edu/marine/. Jane Guentzel can be reached at jguentze@coastal.edu or 843.349.2374.

DEPARTMENT OF PSYCHOLOGY AND SOCIOLOGY

Susan Webb, Ph.D.
Department Chair

The 20 faculty members of the Department of Psychology and Sociology are active researchers publishing on a range of topics including: Alzheimer's caregiving, stroke recovery, hypnosis, bullying, policing, drug and tobacco use, social justice, college success, effective teaching, aging in Russia, social conditions and popular music, masculinity, Southern culture, prison crowding, underdogs, environmental racism, infant development, tattoos, ADHD and more. Students in the department are encouraged to conduct original research and supported in presenting their studies at regional and national conferences and publishing work with faculty members.

As of Fall 2013 there were 461 psychology majors and 235 sociology majors taking classes, conducting research with faculty and community agencies, experiencing internships in multiple settings, and pursuing several degrees: bachelor of arts and bachelor of science in psychology, and in sociology, a generalist bachelor of arts as well as concentrations in criminology, health and aging, and social justice. The department houses the Social Justice Research Initiative and the Gerontology Certificate Program.

For more information about the programs and the many opportunities available, please contact Susan Webb, chair, sewebb@coastal.edu, 843.349.2933, or the Department of Marine Science office, 843.349.2275.

DEPARTMENT OF BIOLOGY

Michael M. Pierce, Ph.D.
Department Chair

The Department of Biology is home to more than 530 undergraduate biology majors, 20 graduate students, 15 full-time faculty and three adjunct faculty. Undergraduate students in our department earn a bachelor of science degree in biology. We also offer other programs of study preparing students for entry into various health professions. Our department participates in the master of science in Coastal Marine and Wetland Studies program and offers courses for graduate students in education.

Students in our department have access to professors with expertise ranging from molecules to ecosystems. Faculty in the Department of Biology take pride in providing excellent opportunities for learning inside the classroom and out. Our faculty have varied research interests, and we provide opportunities for undergraduates to participate in that research.

Please visit the Department of Biology website at coastal.edu/biology/. Michael M. Pierce can be reached at mpierce@coastal.edu or at 843.349.6483.

DEPARTMENT OF CHEMISTRY AND PHYSICS

Brett Simpson, Ph.D.
Department Chair

Our department is home to several disciplines within the physical sciences, including the fields of astronomy, physics, chemistry and biochemistry. Bachelor of Science degrees are offered in chemistry, biochemistry and applied physics.

We offer a dual-degree engineering program in partnership with Clemson University.

Whether you are here for a course in science as part of the core curriculum or you are interested in becoming a chemistry or applied physics major, please contact us with any questions you may have.

Visit the Department of Chemistry and Physics website at coastal.edu/chemphys/. Brett Simpson can be reached at basimpso@coastal.edu or 843.349.2233.
Welcome to the Department of Mathematics and Statistics at CCU. Our primary goal as educators is to improve students’ mathematical understanding and competence. However, we also strive to illustrate the importance of mathematics, both as an interesting and challenging subject on its own, and as a tool that can be applied to other disciplines. Our degree program in applied mathematics is designed to develop a high degree of mathematical proficiency, as well as extensive reasoning and problem-solving skills.

A degree in mathematics opens up many exciting job opportunities in business, industry, government, actuarial science, technology and education. Furthermore, the mathematics degree lays a solid foundation for continued study at the graduate level in any of the mathematical sciences.

At Coastal Carolina University, we are committed to providing quality undergraduate teaching. In addition, we recognize the interdisciplinary nature of the modern mathematical world. Therefore, students may choose to concentrate their studies in analysis, applied mathematics, discrete mathematics, mathematics for secondary education or statistics, while still obtaining a solid mathematical background. We also offer motivated students the opportunity to do research at the undergraduate level.

Please visit the Department of Mathematics and Statistics website at coastal.edu/math. James Solazzo can be reached at jsolazzo@coastal.edu or 843.349.2717.

Our health promotion program features four different areas of study that allow students to personalize their studies based on career or graduate school aspirations:  
- Health promotion with general cognate (designed for students with general health interests or those seeking graduate work in allied health careers)  
- Health promotion with a communication option  
- Health promotion with an exercise science option  
- Health promotion with a health services leadership option

Please visit the Department of Health Sciences website at coastal.edu/health-sciences/. John Yannessa can be reached at yannessa@coastal.edu or 843.349.6460.

In the Department of KRSS, our business is to study human movement through a variety of applications, and business is good! In two of our majors, students study human movement from very different perspectives. Both are essential to the overall health and well-being of individuals and communities. Our major offerings continue to grow and develop. We have added four new faculty members this year to help us keep pace with our enrollment trends. KRSS is now the largest academic department on campus, housing almost 1,000 undergraduate majors. Exciting things are happening in both the Exercise and Sport Science (EXSS) and the Recreation and Sport Management (RSM) programs. We have moved the RSM program back to our “home” base and are excited to be collaborating in the same physical location. We have added additional laboratory facilities to better facilitate experiential learning in EXSS lab courses. EXSS continues to conduct meaningful research in areas such as balance training, active gaming, cognitive training and motor timing. EXSS faculty and students also provide real-world experience and service-in-fitness assessment and prescription. RSM faculty continue to challenge and engage students through a wide variety of active research and experiential learning in areas such as sport marketing, hazing, college sports and senior sport participation. Given all the things our faculty and students are doing, I extend an invitation for you to join our momentum. If you have any ideas or possible initiatives that might fit into our mission and further enhance our connections with students and the community, don’t hesitate to let me know.

Please visit the Department of Kinesiology, Recreation and Sport Studies website at coastal.edu/hkss. Gibson Darden can be reached at gfdarden@coastal.edu or 843.349.2944.
The Department of Computer Science and Information Systems at CCU has recently been updating and expanding its curricular offerings. In addition to the two existing undergraduate degree programs, a B.S. in computer science and a B.S. in information systems, the department is working toward offering a third degree: a B.S. in information technology. The faculty is working closely with Horry Georgetown Technical College in an effort to leverage its existing two-year program in computer technology as a natural feeder for the proposed four-year IT program here at CCU. The S.C. Commission on Higher Education will review the complete proposal during the spring of 2014. Assuming that the proposal is accepted, the IT program will “hit the books” in the fall of 2014.

The department has been engaged in elevating the level of scholarly research conducted by its faculty. With more than 13 peer-reviewed publications in 2012 and over 35 since 2009, CSIS faculty have been successful in conducting research in a broad range of fields, including parallel and distributed systems, software engineering, image processing, multimedia classification, cyber security and CS education.

This fall, we welcome a new member to our department, Satish Kumar, an assistant professor specializing in the area of intrusion detection and response frameworks for cyber security. He has more than a decade of industry experience as well as an M.B.A. and Ph.D. in computer science and engineering from the University of Louisville. We look forward to working with him and to his future contributions to our department.

Please visit the Department of Computer Science and Information Systems website at cs.coastal.edu. William Jones can be reached at wjones@coastal.edu or 843.349.4142.

The School of Coastal and Marine Systems Science houses the University’s marine and wetland graduate programs and the Burroughs & Chapin Center for Marine and Wetland Studies. The doctoral program in coastal and marine systems science, the master’s program in coastal marine and wetland science, and the Center all focus their resources and research on the complex and interconnected environments and processes found in the coastal zone. With the expanding coastal population and the increase in economies dependent on the world’s coastal resources, there is increasing need for advancing the understanding and conveying that understanding to help society to best manage our coastal resources and economy. This becomes particularly critical as the interfaces between land, sea and atmosphere and associated environments are particularly susceptible to changes in sea level, climate and societal modifications.

The graduate program’s focus is on training students to advance understanding of these complex systems, work across disciplines and strive to develop predictive capabilities to aid sound resource management. The region provides an outstanding natural laboratory, offering ready access to diverse fresh, brackish and marine settings. There are also vast areas of undeveloped “natural” landscapes in proximity to the rapidly developing Grand Strand area of South Carolina. The school manages the University’s Anne Tilghman Boyce Coastal Reserve at Waties Island, an undeveloped barrier island and adjacent upland, as well as the University’s new 54-foot research vessel and a fleet of small vessels supporting faculty and student research. The School’s Waccamaw Watershed Academy maintains a certified Environmental Quality Lab. Other research concentrations in coastal and atmospheric processes, coastal ecology, coastal geologic and geophysical studies also maintain an array of advanced instrumentation and technical resources. School faculty and staff are frequently engaged in regional and national technical and environmental panels affording students glimpses of real world application of coastal and marine sciences and needs for future capabilities.

Please visit the SCMSS at coastal.edu/scmss/. Paul Gayes can be reached at ptgayes@coastal.edu or 843.349.4015.
CCU senior John Hairston settles into the Bod Pod.
Maintaining a healthier body weight and level of body fat is essential to a lower risk of disease and a better quality of life. The ability to accurately and scientifically estimate body fat and muscle is needed to make dietary recommendations and exercise prescriptions, and to monitor changes in body composition for those participating in weight loss or weight gain intervention programs. The Department of Kinesiology, Recreation and Sport Studies (KRSS) has been working to develop a facility for the assessment of body composition. Faculty and students in the exercise and sport science program are increasingly engaging the community in body composition assessment. As well, faculty are beginning to use the new “Body Composition Laboratory” to explore some dynamic research questions related to body composition.

**BODY COMPOSITION ASSESSMENT: FROM OUTREACH TO RESEARCH**

The ability to accurately assess body composition is critical for a variety of health reasons. Overweight and obese individuals are likely to suffer from chronic illnesses such as heart disease, diabetes and cancer. On the other hand, underweight individuals with too low a body fat level tend to be malnourished and have a higher risk of reproductive disorders, muscle wasting, and bone disorders such as osteoporosis and osteopenia. Large scale epidemiological studies incorporate body mass index (BMI) (weight in kg divided by the square of height in meters) as a standard measure to identify individuals who are overweight, obese or underweight. Because BMI does not take into account the composition of an individual’s body weight, misclassifications of underweight, overweight and obesity often go undetected. Various laboratory methods are available to health care professionals and researchers working in the field of applied body composition assessment to accurately estimate body fat and identify those at risk of disease. Furthermore, accurate assessment of a healthy body weight and level of body fat is critical to the performance of athletes in sports such as wrestling, power lifting and body building, all of which require weight classifications for competition. Likewise, the same accuracy of body composition is critical to risk factor assessment of those with chronic disease, as well as people working in physically demanding occupations such as public safety (fire and police) and the military.

KRSS’s Community Fitness Testing (CFT) program has worked to provide this type of meaningful body composition information for both individuals and groups who come to campus. Exercise and sport science (EXSS) lab coordinator Stacey Beam has collaborated with the CCU Department of Athletics to measure body composition for its Division I athletes. Jeff Pounds, director of athletic training, says “this has become an extremely valuable tool for our student-athletes.” Many of CCU’s student-athletes have their body composition measured throughout the year, during both competitive and non-competitive seasons. According to Pounds, the athletic training and strength and conditioning staffs are then “able to use an individual’s body composition to educate student-athletes about their specific needs and create specific goals based on those needs.” This has been a reciprocal relationship as well. Data collected during these periods of athlete monitoring has led to research presentations by EXSS faculty and students at both regional and national scientific conferences.

The CFT has served as a location for local and regional high school wrestling teams to have individuals’ weight and body composition certified. This process is a necessary requirement for all high school wrestlers to complete prior to their first competition to ensure that healthy weight maintenance is achieved throughout the wrestling season. Information from the body...
composition analysis is used to certify the proper weight class in which each athlete is allowed to compete. Further, to prevent athletes from losing too much weight too fast, the body composition information is used to set minimum weight classes to which a wrestler could drop. Called weight “bouncing,” this can be harmful for anyone and can specifically lead to declining academic and athletic performance, interference with some physiological systems, and increased incidence of eating disorders. When these high school athletes are on our campus every fall, we have the opportunity to educate them on each of these issues, as well as to provide body composition standards necessary for competition.

In addition to the numerous groups serviced by the CFT, many individuals seek guidance regarding what impact their current levels of body fat may have on their health status and performance endeavors. In 2013, 60 percent of individuals who came to the EXSS Laboratories for fitness evaluations also requested body composition analysis. This information is then used by our professional staff to help counsel individuals when considering how to modify behaviors to help them attain their individual goals. A variety of measurement techniques are used with these groups to estimate body composition, including skinfold analysis, hydrostatic weighing and air displacement plethysmography (Bod Pod).

Cathryn Dooly, Ph.D., a KRSS faculty member, is conducting research that will help health care professionals do a better job of estimating a person’s body fat. Dooly is currently researching a device known as the Bod Pod (now housed in the Williams-Brice Building), which yields information about the amount of muscle and fat a person carries.

Her research addresses some of the potential sources of error that affect the accuracy of this device. One such potential source of error is the presence of body hair on legs, arms and torso, as well as face and scalp. Air trapped in body hair can result in a potentially significant underestimation of body fat when using this particular device. Dooly’s most recent investigation measured body fat and lean tissue in males before and after shaving all hair from the body.

Preliminary findings have indicated that these factors do cause significant measurement error. Continued research in this area will require comparing Bod Pod measures against a criterion reference standard. Underwater weighing, or hydrostatic testing, is a method of determining body composition using Archimedes’ Principle of displacement. The method requires individuals to be completely submerged underwater, a frequent deterrent to subject participation. Underwater weighing has for many years been considered the gold standard for body composition assessment; however, newer and more sophisticated measurement methods may make underwater weighing obsolete in the near future.

Underwater weighing is based upon the Archimedes Principle, which states that the buoyant force on a submerged object is equal to the weight of the fluid that is displaced by the object. This principle can be used to determine percentage of body fat because the density of fat tissue and lean tissue are constant. Lean tissue, such as bone and muscle, is denser than water, and fat tissue is less dense than water. Basically, muscle sinks and fat floats. Thus, an individual with more body fat will weigh less underwater and be more buoyant. Individuals with increased muscle mass will weigh more and tend to sink.

Cathryn Dooly (left) activates the Bod Pod in order to access data concerning the muscle and fat measurements of CCU senior John Hairston (right).
To perform underwater weighing, an individual is first weighed on dry land. Next, the individual will enter a large tank of water. While supported by a special scale, the individual is lowered underwater and asked to expel all the air from the lungs (to decrease buoyancy effects) and remain motionless while the underwater weight is measured. This procedure is repeated several times and averaged. A special calculation is then used to determine lean and fat tissue weight, leading ultimately to the estimation of one's percentage of body fat.

**NEXT STEP RESEARCH**

With the method of underwater weighing moving by the wayside as a criterion-referenced standard, a more accurate instrument that has served as the new gold standard for body composition is DEXA, or dual energy x-ray absorptiometry (pictured above).

This device utilizes very low dose x-ray scans of the body to determine lean, connective, bone and fat tissue. It is quick and convenient for subjects as they are not required to be submerged underwater or to dispel air from the lungs. DEXA has the capacity to assess regional changes in body composition and bone density, which opens doors to research initiatives investigating changes in lean and soft tissue, as well as fat tissue, induced by diet and exercise intervention programming. Bone density can also be monitored in those at risk of eating disorders, a common occurrence in athletic females, as well as in postmenopausal females at risk of osteoporosis.

Due to the expense of the DEXA device, our body composition laboratory does not currently own one. However, in order to explore the application of DEXA as a parallel to body composition research in KRSS, several faculty members in the department recently approached the physicians at Coastal Orthopedics in Conway, S.C. Coastal Orthopedics houses a DEXA scanner and has offered the use of the scanner to the research faculty in KRSS. This alliance presents opportunities for a host of research compatibilities between medicine, athletics and academia. Indeed, there seems to be potential for an emergent academic-medical partnership. According to Dr. Todd Tupis, sports medicine doctor at Coastal Orthopedics, “Our collaboration could certainly help both our practice and the University.”

Dooly’s immediate interest is to determine the accuracy of body fat assessment using the Bod Pod compared to DEXA in African Americans, as there seems to be disagreement among the research community regarding the accuracy of Bod Pod in this population. An additional application of DEXA is to determine the regional pattern of fat loss during and following the implementation and completion of weight loss programming using DEXA. When an individual loses weight, from where is the weight lost initially? Is there a pattern of loss, and is the pattern uniform across individuals, or does it vary by gender, age or even weight loss method? DEXA will be foremost in finding answers to these questions. Other applications of interest for Dooly involve the accuracy of traditional methods of determining body composition compared to DEXA under conditions of extreme dehydration, which is commonplace in the athletic population. The fact that DEXA is resistant to changes in total body water makes it a valuable standard by which to compare.

Jason Cholewa, Ph.D., a new KRSS faculty member, anticipates using DEXA to evaluate the effects of different protein and amino acid supplements on weight lifting performance and body composition. The DEXA will afford more accurate measures of fat and lean tissue mass, as well as changes in limb soft tissue cross sectional area. DEXA would also allow for monitoring bone density changes in older adults undergoing long-term weight-bearing exercise interventions.

Christopher MacDonald, Ph.D., another first-year faculty member in KRSS, anticipates using the DEXA to continue to expand on his previous work investigating lean body mass and body composition as a predictor and a correlate of performance measures in athletic populations. This research will hopefully continue to add to the growing body of literature on athlete monitoring, which is dedicated to the tracking of performance variables to identify how athletes are changing.

Exciting things have been and will be emerging in the KRSS Body Composition Laboratory. The department invites individuals or groups to become involved at a variety of levels. We would certainly welcome any discussions that can increase the impact of this facility and its health-enhancing outreach and research.

Cathy Dooly can be reached at cdooly@coastal.edu or 843.349.4044; Stacey Beam: sbeam@coastal.edu or 843.349.2807; Gib Darden: gfdarden@coastal.edu or 843.349.2944.
by Paul Richardson, Ph.D., Associate Professor, Chemistry
Nine faculty members got together with the hope of improving the biomedical research at Coastal Carolina University; Megan Cevasco (Biology), Fang Ju Lin (Biology), Daniel Williams (Biology), Paul Richardson (Chemistry), Rachel Whitaker (Chemistry), Bryan Wakefield (Chemistry), Michael Dunn (Health Promotion), Stephen Firsing (Health Promotion) and John Yannessa (Health Promotion). The idea was to develop a group of researchers, working as a cohort, to improve the biomedical research experience at our University. Current areas of biomedical strength are focused on three main ideas that reflect the different departments involved in biomedical research. Research in the department of health promotion has an overall focus on community health and assessing measures of disease prevention. This is exemplified by social aspects of health maintenance identification of outcomes associated with healthy communities. The department of chemistry and physics is interested in rational drug design to target bacterial and human systems involved in various disease states. In addition, a novel use of bacteriophages is being developed to help treat bacterial infections. Research in the department of biology uses genetic model organisms to understand cellular and molecular pathways of neurological diseases. There is also a lab that specializes in bioinformatics analysis and molecular phylogenomic modeling of biomedically important microbial genomes.

With those focuses in mind, during the 2013 fall term, the nine professors got together and wrote an application for Coastal Carolina University to join the South Carolina’s IDeA Networks of Biomedical Research Excellence (INBRE). More than 15 schools within the state applied for a place in this program. Only a few primary undergraduate institutions were selected, and CCU was one of those chosen. The goal of the INBRE program is to increase the biomedical research capacity of the state by expansion and networking of research activities of faculty and students at the selected academic institutions. Since we have been selected to the program, we have been tasked with creating a multidisciplinary research network that will focus on: 1) building and strengthening biomedical research at the selected institution; 2) increasing the research base at the selected institution; 3) providing research opportunities for undergraduate students and developing programs to help these students achieve advanced degrees in the biomedical research universities in the state; 4) providing outreach activities to underrepresented students at the local high schools; and 5) enhancing science and technology knowledge of the area’s workforce.

To accomplish these goals, the CCU INBRE team developed a two-pronged program to be implemented at CCU; a summer research program and a target faculty program. The summer program will select four faculty members from the target faculty list, and each faculty member will select one underrepresented high school student, one Coastal undergraduate student and a third student. These students will take part in three student-focused research programs that will engage them in mentored research during the summer and the academic year, while also providing professional development for the selected target faculty. The three student-focused programs are the Summer Coastal Research Experience (SCoRE), the Coastal Research Experience (CoRE) and Coastal Biomedical Research Activity Seminar (CoBRAS). The SCoRE and CoRE programs are designed to mentor area students interested in biomedical careers and provide research opportunities to qualified students. The CoBRAS will model seminar-style talks designed to help develop the student professionally. Each participant will be paid to conduct research during the summer. The high school students will be eligible for a scholarship in one of the biomedical majors, if they decide to attend CCU. This portion of the grant has guaranteed funding for five years $700,000.

The second part of the grant will help the nine target faculty members develop their research programs. The idea is to provide grants that allow the faculty member to focus on research, buy much needed supplies, support an undergraduate research student for the academic year and develop grant-writing skills. Each grant is $50,000/year, renewable each year for up to three years. The hope is that after the three years of funding, the faculty members will have completed enough research to make them successful in acquiring funding outside the INBRE network, thus enabling continued biomedical research and student mentoring beyond the five-year INBRE grant.

It is hoped that this grant will be a transformative experience for the University. With the completion of Swain Hall, the University has greatly expanded the available space dedicated for research. This grant will help fill those labs with supplies and research during the entire year. It will allow faculty to develop resources to expand the biomedical research on this campus. It will provide experiences and programs to help our students move on to professional careers in biomedical/medical fields. The hope is that this grant will be the beginning of many great things to come at CCU.

Paul Richardson can be reached at prichar@coastal.edu or 843.349.2598.
Those of us who are physically active often participate in a warm-up activity prior to working out or competing in an event such as a 5K race or a basketball game in order to perform better. The warm-up period is typically composed of a relatively brief period of low-intensity aerobic activity. The idea is to increase blood flow to the working tissue (i.e., muscle). The resulting increased muscle temperature can lead to enhanced force production, increased speed of muscle contraction, increased nerve transmission, increased metabolic activity within the muscle, and reduced joint and muscle stiffness. Hopefully, these benefits will translate into more powerful movement on the field of competitive play and in the weight room.

A thorough warm-up is also used to reduce the risk of injury. Stretching exercises are often incorporated into the warm-up routine for this purpose as well. While it is well-established that participating in a regular stretching routine can improve range of motion, there is very little scientific evidence to suggest that stretching by itself will reduce risk of injury. This does not mean, however, that stretching should be cast aside. Participating in a regular stretching program can help improve flexibility, which can become more limited as we age and become more sedentary. Furthermore, stretching is very helpful during the rehabilitation of certain types of injuries. Static stretching is the most common form of stretching. This involves moving the limb alone, or with assistance, to the point where range of motion ends and mild discomfort begins. The limb is held in this position for a predetermined period of time. According to the American College of Sports Medicine (ACSM), the recommended total duration of stretching for a muscle or group of muscles is 60 seconds. This can be accomplished in a variety of different ways by varying the number of stretching repetitions. For example, one could hold the stretch for 30 seconds and perform two repetitions of this stretch, or hold the stretch for 15 seconds and perform four repetitions.

Many research studies have documented impairments in performance when static stretching precedes events such as sprinting, jumping, cycling or golf. The total duration of static stretching is related to the magnitude of performance decrement with the smallest decrease occurring with less than 45 seconds of stretching per muscle group. Therefore,
A thorough warm-up is also used to reduce the risk of injury. Stretching exercises are often incorporated into the warm-up routine for this purpose as well.” —Chad Smith

performance is likely to be impaired when following ACSM’s guidelines for static stretching prior to competition or a training session (i.e., 60 seconds of stretching).

Athletes generally do not follow ACSM’s guidelines for static stretching. It is too time-consuming. At the collegiate level, the National Collegiate Athletic Association has restrictions about how much contact time is permitted between the athlete and coach. Therefore, the warm-up routine and subsequent stretching routine need to be very efficient in order to maximize the time spent training. For this reason, collegiate athletes who participate in static stretching prior to training or competition will use a limited-duration protocol (i.e., a single stretch for 30 seconds or less for each muscle group). While there have been a few studies investigating the short-term effects of a limited-duration stretching protocol on various athletic performance measures, the results have been conflicting. Interestingly, similar limited-duration stretching protocols have been shown to improve a person’s range of motion in as little as four weeks when performed several times per week. Therefore, it may be possible to improve an athlete’s range of motion by using a limited-duration static stretching protocol without compromising his/her athletic performance.

Recently, I was awarded a Professional Enhancement Grant to investigate the short-term effects of a limited-duration static stretching protocol on vertical jump performance, a practical measure of an athlete’s lower body power. In most sport performances, power is the most important athletic parameter. Two exercise and sport science students, Rachel Liming and John Hairston, will be assisting with data collection and data analysis for this research study. Liming’s participation in this project is part of her honors course in biomechanics (EXSS 400H), a course that studies physics applied to a living organism (humans, in this case). She will be applying the biomechanical concepts learned in the classroom to better understand how static stretching may alter the manner in which forces are being produced by the body. Hairston’s participation in this project counts as part of his internship in exercise and sport science course (EXSS 495). He has an interest in the strength training and conditioning of athletes stemming from an assignment on static stretching that was given during the strength and conditioning course (EXSS 390) he took last spring. This experience will help both him and strength and conditioning professionals in the field better understand the utility of static stretching prior to training or competition.

Chad Smith can be reached at jsmith6@coastal.edu or 843.349.4043.
Could food addiction be the reason why some people have a difficult time losing weight? Scientists are now finding that certain foods, especially those high in sugar, fat and salt, may affect the brain’s reward system in a way similar to drugs.
ost of the processed foods we consume daily have added sugar, fat, and salt. In fact, food manufacturers are fully aware of this and often layer these flavors so that we can experience the bliss of sugar, fat, and salt together. The reason for blending these tastes is that most people report that food is more desirable when these flavors are together. For example, a chocolate brownie contains both sugar and fat, but a salted caramel brownie also adds a salt punch—so this addition increases the desirability of the brownie.

This “sugar, fat, salt” scenario is also applicable for foods we consider “healthy” as well. A salad of grilled chicken and romaine lettuce would have little sugar, fat, or salt; however, if we salt, flour and fry the chicken, this would add salt and fat tastes. Top the salad with a sweet dressing and you have increased the consumer’s desire for this salad as well as its marketability. Eating these sugar, fat, and salt combinations increases one’s sense of reward upon consumption, thereby raising the likelihood of it becoming harder to resist when future food choices are made.

Why is layering the tastes of sugar, fat, and salt a problem? Because more than one-third of American adults are now obese, and there are many obesity-related diseases. Some researchers have proposed that the addictive qualities of certain tastes may be involved in the cause of obesity for a certain subgroup of obese individuals. The term “food addiction” has been coined as a syndrome that is currently being researched to determine why certain people, especially those who are overweight, find these highly palatable foods so pleasurable and so very difficult to resist.

On a biological level, it has been suggested that food and drug addictions may be closely related. The main similarity between the two involves the neurotransmitter dopamine, which is associated with pleasure or reward. Greater amounts of dopamine are released when individuals consume foods that are considered to be more rewarding. In a study published in the Journal of Addictive Disorders, Wang and colleagues used positron emission tomographic (PET) scans of obese and drug dependent persons and found that both had significantly lower dopamine receptor levels compare to those persons who were lean and/or not drug dependent. The fewer dopamine receptors in obese and drug dependent individuals may prevent them from achieving their desired level of pleasure when either eating or abusing other substances; furthermore, this lowered level of dopamine receptors causes “food addicted” individuals to frequently overeat, particularly foods high in sugar, fat and salt, which can quickly lead to weight gain.

Another biological similarity has been seen regarding activation in the brain due to a food or drug stimulus. Stoeckel and colleagues published research in Neuroimage that suggests high calorie food cues in obese persons are mediated by the hyperactive reward system. These researchers used magnetic resonance imaging (MRI) scans to examine the brains of obese and control groups when shown photos of high-and low-calorie foods. The scans revealed obese participants had higher activation in numerous brain areas compared to the lean control participants; furthermore, higher activation was seen among the obese participants in the same areas of the brain associated with drug cravings when expecting to eat certain foods.

To support the food addiction hypothesis, scientists have also turned to animal experimentation to see how they react to certain tastes. The most convincing evidence for a food addiction model actually comes from animal research. Rats exposed to high fat, high sugar or a combination of high fat, high sugar diets develop behaviors similar to addiction, including compulsive food seeking, withdrawal and binge eating. Rada and colleagues published research in the journal Appetite that found rats on daily intermittent sugar consumption slowly increased their sugar intake from 37 to 112 ml/day, perhaps showing tolerance. Finally, animals who developed a sugar dependence have shown anxious and agitated actions upon removal of sugar from their diet. Although animal research does not necessarily translate into the same findings in humans, it provides avenues for possible further research.

Conquering food addiction is not necessarily a magic bullet for obesity prevention because lack of physical activity and multiple other factors can contribute to unhealthy weight gain. Further understanding of this concept does lead researchers to consider how eating behavior might be driven by visual cues such as food advertisements on television, billboards and the many fast food establishments that we ride by each day. For many people the sight or smell of certain foods can motivate reward-seeking behavior so that more dopamine is released. This, in turn, leads to additional eating due to abnormalities in brain dopamine receptors. In other words, people may seek high-calorie foods for the dopamine release and then desire to eat more to compensate for dopamine deficiencies.

The concept of food addiction is quite a controversial theory that purports that some foods, especially those processed with sugar, fat and salt, trigger an addictive process similar to that of substance abuse. Food addiction is not currently validated as a disorder, and more research is needed to make it clinically useful. If certain foods are in fact addictive, future obesity treatments might also explore methods that have been used to treat substance dependence.

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WHAT'S YOUR MUSICAL FIT?

According to groundbreaking research by a CCU psychology professor, our responses to pop culture, such as music and movies, swing with the times, and the times they are a-changing.

by Terry Pettijohn, Ph.D., Associate Professor of Psychology
My parents grew up outside of Detroit in the 1960s during the Motown music explosion. As a consequence, I grew up listening to artists such as Diana Ross & The Supremes, The Jackson 5, The Four Tops, Stevie Wonder and Marvin Gaye at home and in the car whenever we traveled — which was often. As children, my sister, brother and I did not have any say over the music selections in the car. My musical preferences as a teen in the late 80s and early 90s shifted to rock, metal, grunge and alternative — Red Hot Chili Peppers, Nirvana and Pearl Jam were a few of my favorites. My first concert was to see Skid Row open for Guns n' Roses in Columbus, Ohio, when I was in high school. I even incorporated lyrics by Mötley Crüe, Cinderella and Tesla in my valedictorian speech. While I never joined a band, I have always had a strong appreciation for all types of music. As a social psychologist, I research when and why people prefer different social stimuli, including popular media. I began this line of research with movies and actors and recently extended my investigations to include popular music.

Let me start with how this work began — back when I was a graduate student at the University of Georgia.

In graduate school, I was faced with the arduous task of developing a novel research project — something that added to the field, was important and interesting. I was in a social psychology doctoral program, working with Abraham Tesser as my major professor. I had always been fascinated with different aspects of physical attraction and romantic relationships, including evolutionary theories of human mating. The evolutionary theory of mate selection predicts that men prefer young attractive females and women prefer men with resources because these preferences help men and women differentially pass their genes into future generations. But is this always the case? Can environmental feelings of uncertainty shift these preferences? Together, Tesser and I developed what we called the Environmental Security Hypothesis (ESH). Initially, the theory was designed to explain shifts in attractiveness preferences over changing environmental conditions.
"MOVIES OFFER A GLIMPSE OF THE TYPES OF TRAITS WHICH ARE VALUED BY AUDIENCES AND CULTURES IN GENERAL. PEOPLE FORM STRONG CONNECTIONS WITH ACTORS AND ACTRESSES. ENJOYING MOTION PICTURES HAS ALWAYS BEEN A POPULAR LEISURE ACTIVITY FOR AMERICANS."

-Terry Pettijohn

When social and economic times are difficult, we should prefer more mature individuals who can best handle the stresses and challenges of rough circumstances. When times are good, these mature traits are less necessary for adaptation and survival. And how do we know if someone has these mature traits? Well, we can simply scan their faces and bodies and observe their personality traits.

Previous research has found that people with smaller eyes, larger chins and thinner faces (all mature facial features), and those who are taller are perceived as more independent, dominant and strong. Those with larger eyes, smaller chins, rounder faces (all babyface features), and those who are relatively shorter are perceived as more naive, dependent and more passive. In order for us to test the ESH, we needed a sample of people's preferences for others possessing these varying features over time. We decided to investigate movie actresses as our first study. Movies offer a glimpse of the types of traits which are valued by audiences and cultures in general. People form strong connections with actors and actresses. Enjoying motion pictures has always been a popular leisure activity for Americans. We used an index of star popularity called the Quigley Publications Poll to identify the top five movie actresses for each year from as far back as 1932 through the 1990s. Next, we located facial photographs of each actress, scanned the images into graphics files, and used an established facial feature measurement technique to measure the faces with the help of computer software. We calculated facial height and width and used these measures to create ratios of eye size, chin size, nose size and facial thinness for comparison between years and trends over time. We also collected several measures of social and economic threat, including unemployment rate, death rates, marriage rates and disposable personal income, to create a single general hard times measure (GHTM).

We then correlated the average facial features of the actresses each year with the GHTM. We found support for our theory. Actresses with smaller eyes, thinner faces and larger chins were more popular when times were bad - such as Marie Dressler, Janet Gaynor and Sandra Bullock. A more recent example of a mature face would be Anne Hathaway. Actresses with larger eyes, rounder faces and smaller chins were more popular when times were good, such as Ann Sheridan, Bette Davis, Judy Garland and Rita Hayworth. A more current example of a babyface would be Amanda Seyfried. The actresses study was published in Media Psychology in 1999.

After the actress study, I expanded the ESH to include a more general preference for mature themes and content in threatening social and economic conditions. Other investigations of the ESH have included male movie actors (Pettijohn & Tesser, 2003), movie genres (Pettijohn, 2003), Miss America (Pettijohn & Yerkes, 2004), U.S. Presidents (Pettijohn, 2008), Playboy Playmates of the Year (Pettijohn & Jungeburg, 2004), and experimental lab studies confirming a preference to select a more mature partner after a physical threat (Pettijohn & Tesser, 2005).

Most recently I have been interested in music preference variations related to the ESH (i.e., Pettijohn & Sacco, 2009a, 2009b). In the first music study, student research assistant Donnie Sacco and I scoured the Billboard pop charts from 1955-2003 and found audiences prefer more meaningful songs and more mature looking pop artists when times are rough. We also used a text analysis software program called the Linguistic Inventory and Word Count (LIWC; Pennebaker et al., 2001) to investigate the lyrics of the pop songs of the year. The program counts words in different categories or themes for trends. Meaningful, comforting pop songs...
that emphasized social connections, friendships and the future were popular in bad times. Jason Eastman, associate professor of sociology, and past psychology major, Keith Richard, assisted with an analysis of the beats per minute and keys of pop music (Pettijohn, Eastman & Richard, 2012). Upbeat, celebratory dance music in common keys, such as the Monkees’ “I’m a Believer,” were popular in good times, and slower, more meaningful ballads in less familiar keys, such as Lionel Richie’s “Say You, Say Me,” were popular in tough times.

Eastman and I recently completed a study of country music which will soon be published in Psychology of Popular Media Culture (Eastman & Pettijohn, 2014). Country and pop audiences prefer older performers when times are tough. However, country songs of the year run counter to pop songs of the year by having more positive lyrics, being more upbeat and using more happy sounding major chords when social economic conditions are difficult. Country musicians are also more likely to be female when times are threatening. Individuals who favor country music, typically working class individuals who are taught to accept their economic situation in life, may use the music in a more cathartic way compared to middle-class audiences who favor pop music. Psychology majors Jamie Glass and Carly Bordino, myself and Eastman also explored the facial features of country artists. Similar to the pop artists, popular country artists have smaller eyes and larger chins in challenging social and economic conditions. This work is in press at Current Psychology.

Studies testing the ESH have been the focus of many media sources all over the world, including MSNBC, CNN, Discovery Channel, NPR, NY Times, Chicago Tribune, BBC, Rolling Stone Magazine, Newsweek, the Rachel Maddow Show, South Carolina Education Radio and others.

There are still many social preference areas to investigate and applications to consider. One application is how performers and recording studios can adjust the timing of a song release to yield the greatest audience response. For example, past research has shown seasonal variations of music preferences (Pettijohn, Williams & Carter, 2010). We like reflexive and complex music in the winter and energetic and rhythmic music in the summer. Lorde’s ‘Royals,’ a powerful commentary on the path to fame and wealth in the music industry, recently won a Grammy for best pop solo performance of the year. The timing of this methodical melodic anthem and its rise to popularity fits well with the ESH as we continue to rebound from an economic recession and struggle with social inequality in America. In addition, marketing executives may use these results to create effective product advertisements. I consulted with an executive at AXE on musical selections for different body and shower products advertisements based on economic considerations, specific products and target consumers.

In summary, my research suggests our musical preferences mirror our individual and societal experiences in fascinating and partially predictable ways. Although there are many complex factors working together to determine musical preferences, the ESH contributes a piece to this puzzle.

I was selected to present the 2014 HTC Distinguished Teacher-Scholar Lecture on March 31, 2014. I was honored to receive this award and enjoyed sharing my research on musical preferences and environmental security during my presentation.

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helping students succeed

The College of Science Advising Center works to “develop students who are both knowledgeable in their chosen fields and prepared to be productive, responsible, healthy citizens with a global perspective.”
The Academic Advisers are committed to helping students:

- Create a plan for graduation.
- Make course selections and plan course schedules.
- Understand University policies and procedures.
- Learn about campus support services.
- Work through academic issues.

The College of Science Advisers shares its methods and experiences:

**THE FIRST-YEAR ADVISING CENTER SERVES THREE PURPOSES**

1. To help students become acclimated to Coastal Carolina University.
   
   With the beginning of classes, students are quickly informed about all the resources available for them. In addition, they are encouraged to make the connection to the school a positive and fulfilling choice. Expectations are discussed thoroughly, and guidance is given to nurture this population so they can become well-informed students who make the adjustment smoothly.

2. To provide support to students so they can take ownership of their careers.
   
   Our students are reminded that attendance is vital, being an informed student is crucial, and actively participating in experiential learning exposes them to career opportunities. The advisers are very supportive of students while encouraging their independent growth and becoming well-rounded CCU Chanticleers! They share inspirational stories to encourage the sheltered, words of wisdom to the mature, laughter and cheers to the well-adjusted, and a box of tissues to the alone and lonely. Their hats quickly change to accommodate each student’s need. They meet our students where they are as individuals and at their academic level. The goal is to allow the developmental process to evolve as responsibilities and obligations become essential to being a successful student.

3. To make the transition from being a freshman student to becoming a sophomore with a faculty adviser.
   
   When this level is reached, students are expected to take charge of selections of classes, utilize campus resources, research issues for clarity and understand the significance of their major. Students will connect with their faculty advisers for in-depth knowledge and sharing of experiences about their chosen field of study. Although the First-Year Advising Center initiates new beginnings for first-year students, it is actually after the completion of the first-year that our students are acclimated to the University, taking ownership of their careers and taking steps toward becoming alumni of this premier institution.

   —Marcella Greene

Within the students’ first-year at CCU, the academic advisers have made a conscious effort to make connections with the individual departments to see which courses and other academic requirements faculty need from first-year students before going into their second year. Linking with the departments has given the advisers the ability to assist students in beginning the coursework in their major in a more timely and efficient manner. The goal behind this is to link students with the coursework they are more passionate about and retain more students in the College of Science and in CCU as a whole.

As academic advisers, the objective is to assist students in planning their academic strategy with the main goal of graduating in the most timely and efficient way possible. In order to accomplish this, advisers make a conscious effort to help students understand the resources available on campus to help guide them through their coursework, becoming more independent in the process. Our goal is to assist students in understanding their program requirements so they can essentially advise themselves in the coursework, freeing up their time in the future to discuss internships and research opportunities with their faculty advisers. As the economy has become more competitive for college graduates finding work, it is our hope that we are developing students who understand how to fully utilize the curriculum independent of direct supervision so we can focus more on the mentoring of students from a professional standpoint, linking them to faculty through research and internships.

   —Brian Wagner

My caseload comprises a group of freshmen advisees and all students on probation in the College of Science.

While working with freshmen, I work very closely with the other three academic advisers in the College of Science. Our goal is to transition students into the University with ease, while teaching them how to read their
"As academic advisers, the objective is to assist students in planning their academic strategy with the main goal of graduating in the most timely and efficient way possible."

-Brian Wagner

program evaluations, familiarizing them with many of the different processes of the University they need to know to navigate CCU, and guiding them through selection of their first year and first semester sophomore year classes. During this time, many questions are answered, for example:

- What should I do, my car broke down and is in a handicapped designated spot?
- Who do I talk with about tutoring in the biology department?
- Where is Student Accounts?
- I would like to join the band, how do I do that?
- Where do I go to have credits transferred since they are not showing on WebAdvisor?
- What do I need to do to take classes at another university over the summer?
- Are there any physical education classes available?

As you can see, the list is lengthy and varied, and this is only a sample. The goal is to answer as many questions as possible, or to refer the students to the correct place to get their answers. Advisers are responsible for the academic advising section of Orientation. It is during this time information that an incoming freshman needs to know is reviewed. Their first semester schedule is built prior to Orientation and distributed to them out during this segment.

I find it very rewarding working with freshmen, watching them grow and become more independent during the year while preparing them to move on to their department of choice. A few come back just to touch base or with more questions.

Working with students on probation in the College of Science is a very different dynamic. Most are beyond their freshman year, some have the earned credits to have a designated faculty adviser in their department and some do not. Presently, there are two Academic Recovery Classes taking place for those students who choose to be a part of the class, and the information generally changes their lives and their academics. I truly wish there were more students who recognized they need this class.

During the semester, I offer “Tips and Tricks, How to Study Smarter Not Harder” workshops. The workshop is designed for a quick one-hour overview of study tips covering time management, reading, outlining, notes and how to plan a paper, project or presentation. This workshop is required for all students in the College of Science who are on probation, but anyone is welcome.

-Nancy Parchesky

For many students, the journey to a university is the first time away from home and the first chance to truly make independent decisions without the safety net of a parent. Some students handle this new level of freedom remarkably well and continue to be motivated by their own internal barometer, while others struggle to achieve the developmental milestones associated with independence. The students who are struggling often benefit from the course University 110, which is designed to assist students with transition issues related to first-time freshmen.

The College of Science recently revamped the curriculum in University 110 to be more mindful of the needs of our students. We have divided the course into two distinct divisions. The first half of the semester, we work on transitional and academic issues like managing time, study skills, coping with stress, and the procedural aspects of college. In the second half of the class, we focus on experiential learning in which the students have the chance to attend a field experience, seminar or workshop to see what new research, ideas and methods are being used in the field of science.

Whether I am advising a student or teaching University 110, the goal is to form a partnership with the students, to help them understand their options and the possible consequences of their choices. I want them to see me as a resource for information and support.

-Kelli Lynn Moses-Dolfi

The COS Advising Center is located in Room 206 of the R. Cathcart Smith Science Center.
The department of recreation and sport management has teamed up with the Grand Strand Miracle League, an organization dedicated to providing those with special needs this life-changing opportunity.

Founded in Myrtle Beach in 2001, the Miracle League became the second all-access baseball league in the nation. Fueled by generous community support and a passionate board, an ADA adapted and approved baseball field was constructed. The rubberized surface of the field is perfect for wheelchairs and walkers, making it the ideal place to start a league with the following rules: Everyone Plays. Everyone Crosses Home Plate. Everyone Wins!

Sport managers work in a dynamic environment in which there are no true constants. The sport environment is ever changing and requires leaders who have the ability to not only comprehend and navigate these changing conditions, but to be able to quickly adapt to different situations in order to effectively solve problems and make decisions. Traditional pedagogical techniques and strategies incorporate subject matter in didactic format via lectures and seminars. While this approach is essential and necessary in today's classroom, educators need to foster an environment where higher order thinking is incorporated into sport management curricula.

It is theorized that when students are actively engaged in experiential learning process, students begin to "learn by doing" and begin to take responsibility for their own learning processes.

Experiential learning has become an important piece of many sport management programs. Kolb (1984) describes the process of experiential learning as "Knowledge created through the transformation of experience." It is through this process that students move through a series of steps including 1). encountering concrete experiences; 2). dealing with experiences through reflective observation; 3). asking questions and forming generalizations through abstract conceptualization and 4). answering questions or solving problems through active experimentation.

This model is being put to the test through a semester long Sport Operations Education Program (SOEP). This program involves the application and subsequent selection of five Junior/Senior recreation and sport management students (Robert Dogan, Julian Hearth, James Kalinowski, Jack Morris and Bryan O'Connor) who had successfully completed 12 hours of prerequisite courses including Sport Law, Marketing, Sport Marketing and Leadership. Students then had to submit application materials and go through a formal interview to be selected for the SOEP program. Sport management faculty, Drew Czekanski, Ph.D., and Colleen McGlone, Ph.D., worked with Tory Mackey, executive director of the Grand Strand Miracle League, to coordinate an experiential learning environment for students that included the students being able to run logistical and operational aspects of planning and implementing events for the Miracle League. Examples of this partnership included creating and implementing events for the organization such as the soccer kickoff, theme games, family appreciation day, pirate day and under-the-big-top events on game days. Students were tasked with obtaining sponsorship, designing the marketing campaigns, providing in-game entertainment, and working with media and field maintenance. In addition, the group will work with Horry County schools and the Miracle League to create a field day for students with special needs. Students also worked with local businesses and the Grand Strand Miracle League's board of directors in order to make the partnership a success.

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VMP
vertical microstructure profiler

A NEW INSTRUMENT FOR PHYSICAL OCEANOGRAPHY HELPS MEASURE THE MOVEMENT OF THE OCEAN AND EVERYTHING IN IT.

by Diane Bennett Fribance, Ph.D., Assistant Professor of Marine Science
One of the most exciting parts of being an oceanographer is getting to go out on the water and make measurements that help to explain how the ocean works, and in my case, that relates to the movement of the water and everything in it.”

—Diane Bennett Fribance

In order to better make local observations as part of the growing Physical Oceanography program at CCU, I recently acquired a VMP 250, or vertical microstructure profiler, for my lab. This instrument, made by Rockland Scientific, is deployed over the side of a boat in coastal environments. It free falls through water at a constant rate, taking extremely fast samples of water velocity using two shear probes. These measurements make it possible to estimate dissipation of turbulent kinetic energy over the full water depth.

You may know that computer models are often used to make predictions about what is going on with our oceans. The general public has become more aware of these models as they are used to make projections about the possible effects of climate change on ocean temperature and sea level rise, but they are also used for a variety of predictive applications including those involving the biology, chemistry and geology of the oceans, in addition to pure ocean physics applications.

The models are based on sets of equations that are simplifications of what we know about the forces driving ocean circulation. Simplifications are necessary because, despite increases in computing power, we still can’t solve the full equations with available resources.
One simplification that is typically applied involves ocean mixing or turbulence. Turbulence is by nature a random process, making it very difficult to predict with high precision. Our turbulent models are known to be over-simplifications, something that can only be corrected by making new measurements to observe mixing under a variety of conditions in order to improve our understanding.

Energy is constantly being added to the oceans through wind blowing across the ocean surface and the regular forcing of tides. This input of energy typically leads to motion of the water or ocean currents. This energy must eventually be used up within the oceans in order for there to be a balance.

Energy can be lost to friction with the sea floor. It can also be used through the generation of turbulence or unstable flows. Understanding the precise balance of how energy is used within the oceans is an ongoing research question requiring more direct observations of turbulent regions.

I traveled to the home of Rockland Scientific in Victoria, British Columbia for a training session on our new equipment in September of 2013. The training included several days of learning how to assemble and disassemble the instrument and one day on the water doing test deployments with CCU's VMP. We headed out to deep water in the Saanich Inlet on the R/V (Research Vessel) John Strickland to run some test profiles and to learn how to properly deploy and recover the instrument. Many of the staff were on hand to assist, and Kimberly Arnott of the University of Texas participated in the training as well.

The new instrument will be used this coming May, and possibly also during an upcoming collaboration with colleagues at the University of Georgia working on their LTER (Long-Term Ecological Research) project to better understand the interaction between marshes along the shoreline and the coastal ocean ecosystem. I am excited to take this cutting-edge scientific tool and put it to use in our local waters to better understand circulation and mixing off the coast of the southeastern U.S., and I look forward to sharing my results with the Coastal community in the near future.

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Being granted the opportunity to be a Swain Scholar has completely altered my undergraduate experience for the better. Unlike many scholarships that solely require an essay to be written or specific prerequisites to be met, being a Swain Scholar is an active experience in that students are role models, leaders, community activists and researchers. The role of a Swain Scholar has provided me numerous public speaking opportunities, classroom learning, experiential learning and many life lessons along the way.

Four classes are built into the Swain Scholarship, led by a faculty adviser in the Department of Health Sciences. Our first year, we collectively began a major community outreach project. It was spectacular to go through the process of developing something of that magnitude while having direction and guidance all along. It was really powerful for me to be able to take what I was learning in class and get to experience it in my community. The best quality of learning happens in the field.

When we were at Palmetto Bays Elementary School implementing our program, we could really understand what worked and what did not. It provided us invaluable knowledge as students and researchers. This type of work means so much more to me than a class project based on a fabricated situation. Granted, it is necessary to practice various scenarios that are not all available in our community, but when I know the work will be making a real difference, it pushes me to give my greatest effort.

I have noticed that a different degree of passion and attention to detail is developed when designing a program for community members rather than for an imaginary population.

As a health promotion major, participating in the Swain Scholar program solidified my degree pursuits and career choice. I love working with diverse populations. I enjoy the creativity of needs assessment and program planning. Implementation—connecting with people and helping them live a little bit healthier is extremely rewarding.

Finally, having a research component is essential in discovering if efforts are effective. To evaluate the program and its impact on the population, valid data collecting and analyzing is paramount. Learning how to properly conduct an evaluation by using the correct instrument to gather preliminary and post data was extremely valuable. These research tools can provide proof of a program's worthiness to receive funding, as well as the impact it has had in order to maintain or increase funding.

By being a Swain Scholar and getting the experiential learning to back up my classroom education, I am confident that I have the skills and knowledge necessary to be a successful health educator. I know how to create a successful program from start to finish, and I have learned what resources to utilize if I ever get stuck. The program was a perfect fit for me as an undergraduate student, and I am so grateful that I was able to have the powerful experience that comes with receiving this scholarship.

Interested Swain Scholar applicants should contact Sharon Thompson, professor of health promotion. College of Science at 843.349.2635 or email: thompson@coastal.edu.
TRAVELING CHEM STUDENTS

by Brian Wakefield Ph.D., Assistant Professor, Chemistry/Physics

The theme of the 2013 Southeastern Regional Meeting of the American Chemical Society (SERMACS) held in Atlanta, Ga. Nov. 12th-16th was “Building Chemical Bonds.” The goal was to bring together chemists from the different areas of the chemical community: academic, industry and government. This conference presented the Coastal Carolina University biochemistry and chemistry students with an opportunity to present their research to a broad audience while learning about careers and graduate programs in varied fields.

A group of five CCU students gave poster presentations during the conference. The students shared their results and excitement for their research with fellow students, and representatives from companies, as well as faculty from universities throughout the Southeast. The presentations given by CCU students covered the fields of biochemistry, and inorganic and organic chemistry. Kristen Polivka and Brandon Tierney presented posters on their biochemical research with professor Rachel Whitaker. The posters were titled “Geometric Shifts in the Zn2+ Chelating Pocket of the ZN-1 domain within E. coli LeuRS Contribute to the Stabilization of Adenylate” and “Creating a Pocket-Sized Biosensor for the Detection of Heavy Metals in Drinking Water,” respectively. Tyler Aslund represented inorganic chemistry with his poster entitled “Oxygen Reduction Reactions Catalyzed by (nitro)cobalt(III)hexadecfluorophthalocyanine derivatives.” Professor John Goodwin directed this research project. The final two students, Ashley Klarich and Victoria Knotts, presented their organic chemistry research, directed by professor
Bryan Wakefield, in a poster entitled “Brønsted Acid Promoted Friedel-Crafts Additions of Indole.” Klarich found that presenting her research was a rewarding experience because, “I was able to educate others and present all of the hard work we’ve put into our project.” The students all enjoyed the experience with Aslund summing it up by saying: “It was actually quite fun to share with others what I had been researching.”

In addition to the poster session, the students were able to attend presentations by faculty, students and members of industry. The students were free to attend any presentation they found interesting based on their field of research; there were also a few sessions that all of the students attended. First was a presentation by Dennis Liotta for Emory University. Liotta is a medicinal chemist and respected entrepreneur who has started numerous companies based on his research. His presentation focused on the business aspects of drug development and the changing business model of pharmaceutical companies. His focus currently is on how research universities and industry can collaborate to bring new drugs to market in order to address diseases that are not typically investigated. This presentation gave students insight on the steps required to bring a drug to market and the changes in business that will affect their future careers. The students also attended a graduate student panel where they heard about the life of a graduate student and received guidance on how to be a successful applicant. Additionally, graduate schools and companies were recruiting throughout the conference, giving students the opportunity to discuss the application and hiring process. Polivka found the experience to be beneficial for her future, saying “it helped to teach me what companies are out there hiring at this time and what types of research projects graduate schools are focusing on to give me ideas on what the best fit for me is once I graduate.” Similarly, Knotts said that she “made some contacts for graduate school that I would not have made otherwise. I also learned about a few summer internship positions that I can look into for this coming summer to gain experience for graduate school as well as a future job.”

The SERMACS trip was not all work—there was plenty of fun for the students as well. One afternoon, the CCU contingent went to the Georgia Aquarium. The students were able to see aquatic life of various climates from throughout the world. The students enjoyed taking pictures of themselves with jellyfish and sharks just behind them, along with photos of sea creatures that they then sent back to their marine science friends at CCU. Later in the week, there was a conference-sponsored trip for all the undergraduate students to the World of Coca-Cola Museum. The students were able to sample Coca-Cola from all over the world and learned that the flavor of Coca-Cola is tailored to each country. Besides being fun, this was an opportunity for our students to meet peers from across the region that they may one day share a lab with in industry or graduate school.

Overall the trip to SERMACS 2013 was a fun and educational experience for our students. The students were able to build on their chemistry knowledge while building new bonds with members of industry and academia. Based on the success of this trip and the positive feedback from the students, the Department of Chemistry and Physics is sure to encourage more of our students to go to SERMACS or a national American Chemical Society meeting in the future.

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When I meet people, as a general rule of thumb, I try to avoid the topic of occupation, especially in regard to my own. However, humans are inquisitive, informalities take over and the inevitable question comes up: “What do you do for a living?” First answer, “I work.” “What type of work?” “I teach.” “Oh, you are a high school teacher?” “No, I teach at a university level.” “Oh! What do you teach?” “I teach math.” This last statement really is a game changer. There is a very brief moment of silence as I change from just a guy at the party, into a priest or therapist, hearing the following confessions: “I have never been good at math.” “Math hates me.” “Everyone in my family got the math gene except me.”

I’ve had such encounters on many occasions, with complete strangers! Certainly all Americans can’t think this way?

Similar scenarios happened earlier in my teaching career, students confessing to being bad at math or telling me how much they struggled with it in high school, and so on. However, the first time I distinctly remember it happening was my first semester at Coastal Carolina University, fall 2004, while teaching calculus 1. At the end of class, on the first day of class, a student approached me and stated the following: “Hi, Dr. Solazzo, it’s nice meeting you, and I just want to introduce myself. My name is Felix Restuccia.” I thought to myself, “Nice guy, must be an example of southern hospitality.” Felix continued, “By the way, I have never been good at math.” I would like to say that I was speechless; however, those who know me realize that would be a lie, as shown by my statements above. I immediately said, “Please don’t ever say that again! In fact, each morning when you wake up, I want you to say, ‘Today I am going to improve my math skills.’” For the last 10 years I have been hearing students proclaim that they have never been “good at math.”

Recently, I became chair of the department of mathematics and statistics. In addition to attending events/parties where people inevitably speak about never having been “good at math,” and students truly believing that they have never been “good at math,” parents are now calling me, insisting that their child has never been “good at math!” Or, they go on about how they were never “good at math,” and that, therefore, is the reason why their son/daughter shouldn’t have to take a certain math course; in other words, the student doesn’t have the “math gene.” Additionally, academic institutions across the nation are changing their required math courses because either students cannot complete a given math course successfully, or they are losing majors because of a math requirement. Can administrators honestly believe that students who choose their majors really don’t have the “math gene?”

It seems that our American society believes that one is either “good in math” or one is not. If one is not, then there is no sense in trying. That is simply not the case, and that type of thinking is handicapping our youth as well as the American workforce. The goal of this article is to convince the reader that being “good at math” is nothing more than a desire to learn coupled with a consistent work ethic.

I understand that everyone, including me, is not capable of winning the Fields Medal in mathematics. However, all students with a high school diploma who want to pursue a Science, Technology, Engineering and Math degree have the potential to successfully complete the necessary math courses. It is estimated that the STEM workforce will increase by approximately one million in the next decade. Thus, there is an increased need for STEM graduates in order for the U.S. to stay competitive in the global economy. Incoming
freshmen are interested in STEM fields, but less than 40 percent of the students entering college as STEM majors will graduate with a STEM degree. Simply increasing the retention rates of the STEM majors will go a long way toward the goal of one million STEM workers in the next decade. I suspect that mathematics is one of the most difficult hurdles for these students.

I don’t know why a large percentage of incoming freshmen enter college underprepared in mathematics. I don’t know why the percentage of college students failing such courses as college algebra continues to increase at a rate that would make an administrator blush. Nor do I have solutions to remedy the mathematical deficiencies facing our country. Nonetheless, here are a few of my thoughts and experiences regarding this situation.

My daughter, Isabel, is in kindergarten. Each week she brings home a one page agenda for that week, which follows.

"Monday: Write your new words three times each, and add words to your index cards. Read a book and color your reading log, Sh consonant. Tuesday: Read a book and color your reading log, and work on Nonsense Words/Real Words. Wednesday: Read your library book, color your reading log, and work on the sound of Ww. Thursday: Have an adult read the sentence, and you write it. Remember to spell all word wall words correctly, and any unknown word, you sound out and write the letters you hear." Furthermore, as Isabel’s parents, we are encouraged to read with Isabel 15 minutes a night and in fact, there is a form to write down the books that we read each night. If we read 25 books in a month, Isabel receives a coupon for a free pizza at Pizza Hut.

Then, in depressingly small print, hidden on the page away from the suggested daily tasks, it states: “Math Skills: Building number sense through counting and identification.” Seriously!!! I am, as an educator, obviously very supportive of developing strong reading skills; however, what about incorporating daily mathematical evening activities as well? Isabel and I look for different objects to count and organize by groups every night. While driving in the car, we count to 100 by tens and by fives. We are still working on counting to 100 by twos. We identify geometric objects in the grocery store and which box has more cookies and why? Someday a teacher will say, “Isabel you have the math gene,” and Isabel will reply, “No, I just think about math everyday.”

My friend Felix, who I mentioned earlier in the article, passed both college algebra and trigonometry with the lowest possible grade, 70. He was terrified to be in calculus 1. I have to admit that I was nervous for him. Felix came to every class and sat front and center. He would spend six to eight hours per week in the Math Learning Center and attended my office hours frequently. Just as he would master a topic, I would introduce a new topic (chain rule, implicit differentiation, etc.). Felix’s face would grimace with frustration visible to anyone paying attention. This cycle continued for 15 weeks, resulting in his receiving a 71 on exam one, a 70 on exam two, a 68 on exam three, and a 71 on exam four. Oh no! The one situation I didn’t want for Felix! A cumulative final exam in calculus would determine whether or not he would pass the class. Felix conquered calculus by making a 73 on the final exam. He is the type of individual that I want on my team. “Natural talent” is simply overrated.

One of my favorite quotes, which I share with all of my classes, comes from Tsutomu Ohshima, founder of Shotokan Karate of America. “Those who achieve the most are not the most skilled, but are those who concentrate long after the others have given up.” Felix took this quote to heart. This type of philosophy is ingrained throughout the Asian culture. It is not surprising that 10 of the top 12 participants in the 42nd Annual United States of Mathematical Olympiad were Asian Americans.

My point here is that people are “good” at things because they work at being “good” at them. In our American culture today, we are in awe, almost to a worshipful degree, of the athlete who overcomes lack of talent and physical limitations by having a relentless work ethic. Rather, our communities should focus more attention and energy toward encouraging students whose relentless work ethic allows them to achieve the goal of high school graduation, then on to becoming doctors or scientists, etc. Felix is one of my heroes! I don’t believe in genetic determinism when it comes to education. Furthermore, as far as I am concerned, there is no debate between “nature vs. nurture.” In the classroom, nurture wins every time, along with hard work and determination to achieve. America needs to move back to its roots, that is, a culture of hard work.

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College of Science professors left their customary class­rooms and met with small groups of freshmen this past fall to talk about the beauty they see in their everyday work as scientists. Dean Michael Roberts invited COS faculty and more than 800 first-year science students to these informal sessions, in a program called “One Talk, One Time.”

Professors spoke about what they love best – the intricacies and curiosities of their research interests. Students had the opportunity to hear and ask questions about fractals and fast balls, drones and dragonflies, cryptography and kleptoplasty.

What’s kleptoplasty? Well, after the sessions, about 20 COS freshmen can tell you all about it. Students ran, jumped, stretched and danced with COS faculty, explored the Intracoastal Waterway on the University’s pontoon boat with marine scientists, and toured the microbiology laboratories at Conway Medical Center with a favorite biology professor.

Faculty hoped to show students that science isn’t all textbooks and studying for exams; it’s doing what you love and getting paid for it. A sampling of the days events are captured in the photos shown, some of the many photos taken that day.

Students practiced radio tracking skill with Scott Parker, assistant professor of biology, by trying to locate a simulated animal to which a radio tracking receiver was attached. Several simulated tagged animals were hidden around campus in places where an animal would likely hide. There were a few relatively easy examples, along with receivers in more distant hard-to-find locations. “It’s challenging enough,” Parker said, “to try to find something stationary when it’s hidden under plants, leaf litter, etc., but I think it gave students an appreciation for how difficult finding tagged animals can be if they’re actually moving around the environment.”

“Everything has beauty, but not everyone sees it.”
-Confucius
What’s Kleptoplasty?

by Megan Cevasco, Ph.D., Assistant Professor, Biology

The term kleptoplasty is used to describe the ability of a heterotrophic host organism to “steal” the photosynthetic organelles (plastids) of its prey. Stolen plastids (kleptoplasts) remain functional within the host for extended periods of time and enable the host organism to photosynthesize and obtain energy through autotrophic CO2 fixation, as well as from heterotrophic feeding, a condition known as mixotrophy. Mixotrophy due to the kleptoplastic condition has been shown to have important stabilizing effects on the trophic structuring in ecosystems by increasing the total primary and secondary production in planktonic food webs, facilitating carbon transfer from microbial to metazoan trophic levels, and enhancing nutrient cycling. Moreover, in addition to providing photosynthesize, kleptoplasty may also contribute to providing oxygen in low oxygen habitats.

The kleptoplasty phenomenon was first described in the sacoglossan mollusc (sea slug) *Elysia chlorotica*, but has subsequently been identified in several unicellular marine eukaryotes including several in a group of shelled amoeboid protists (Foraminifera). Multiple foraminiferal genera are known to harbor kleptoplasts: *Bulimina*, *Elphidium*, *Haynesina*, *Nonion*, *Nonionella*, *Reophax* and *Stainforthia*. These plastids were found to remain photosynthetically viable for up to nine weeks.

*Elphidium* and *Haynesina* are common inhabitants of South Carolina estuarine and tidal marsh habitats, along with multiple non-kleptoplastic genera (e.g. *Ammonia*, *Ammobaculites*, *Quinqueloculina*). Little is known, however, about the establishment and maintenance of this organellar endosymbiosis. Using both molecular and microscopic techniques, the Cevasco lab is investigating the kleptoplastic condition in the foraminifera inhabiting tidal marsh habitats along South Carolina’s coast.

Megan Cevasco, assistant professor of biology, addressed students on the meaning of “kleptoplasty,” a term that readily gets interpreted as “stealing.” *(See sidebar on the right.)*

Kim Poston, teaching assistant, biology, gave the students a whirlwind tour of the inner workings of a busy hospital laboratory. The students got an overview of the various departments such as blood bank, hematology, urinalysis, chemistry, pathology and microbiology. After the tour, they attended a question-and-answer session with medical laboratory scientists.

Jane Guentzel, chair/professor of marine science, Ms. Margaret Stoughton, Captains Richard Goldberg and Sam Gary, conducted a field trip, and students collected water samples at four locations on the Intracoastal Waterway near Little River. The students measured temperature, salinity, dissolved oxygen and turbidity in the samples.

Kleptoplasty observed within a living foraminiferal host. *(left)* Confocal image three dimensional projection of autofluorescence emitted from plastids sequestered within a tidal marsh. *Elphidium* foraminifer (scale bar = 50µm).

*(right)* Confocal/DIC image overlay showing the plastids retained within chambers divisions in the foraminiferal cell.
WHERE'S THE BEEF?

by Jason Cholewa, Ph.D., Assistant Professor, Kinesiology, Recreation and Sport Studies

ACCORDING TO THE "JOURNAL OF MEAT SCIENCE," RED MEAT, INCLUDING PORK, BEEF, LAMB, OFFAL, LARGE GAME AND GOAT HAS RECEIVED A BAD REPUTATION OVER THE PAST TWO DECADES.

Red meat has been associated with cardiovascular disease, obesity and even cancer; however, emerging research from randomized controlled trials demonstrates the many health benefits to eating red meat, especially for seniors. Red meat was first termed "unhealthy" due to its saturated fat content. However, all saturated fats are not created equal. There are several different types of saturated fats, with about 80 percent of the fatty acids in red meats comprised of oleic, steric and palmitic acid. While consuming isolated palmitic acid does raise LDL (AKA: bad) cholesterol, lean red meat has been shown to affect cholesterol similarly to eating chicken or fish. A recent study of more than 650,000 people published in the "Annals of Internal Medicine" concluded that the connection between saturated fat and heart disease is unfounded. Further, a study by PLoS Medicine demonstrates that industrial trans-fatty acids, diets high in refined starches and sugars, and high levels of sodium intake are the greatest nutritional contributors to heart disease.
A recent controlled trial published in the “American Journal of Clinical Nutrition” compared the traditional “heart-healthy” DASH diet, which limits red meat to one ounce per day, to a modified DASH diet whereby five ounces of red meat were consumed every day. The beef-rich diet was equally effective in reducing cholesterol and more effective than the DASH diet in reducing apolipoprotein B, which is considered a greater indicator of risk for coronary artery disease than LDL cholesterol. This and other randomized controlled trials suggest that lean red meat should be included in part of a balanced diet to manage the risk of cardiovascular disease.

A calorically appropriate diet that is rich in nutrient-dense foods such as minimally processed fruits and vegetables, fiber-rich whole grains, low-fat dairy and lean meats in conjunction with exercise helps support a healthy weight throughout life. Red meat has been associated with obesity, however, confounders such as non-discriminatory food selection (e.g.: a McDonald’s cheeseburger vs. lean steak), total caloric intake or physical activity may explain the relationship. On the other hand, controlled trials published in the “Journal of Nutrition” show no differences in weight loss between white and red meat as part of a higher protein diet (up to 30 percent of caloric intake) and especially when combined with exercise. These studies suggest that red meat can be successfully incorporated into a weight management diet.

Traditionally, red meat, as part of the western diet, was highly associated with cancer risk. More accurate models of etiology and the results of a large prospective study presented at the Annual Meeting of the American Association for Cancer Research showed little to no association between fresh (not processed) red meat consumption and cancer risk. More recent studies in the “American Journal of Epidemiology” also show that the risk of cancer and cardiovascular disease is increased with processed, but not whole, meat consumption.

Red meat is rich in protein, zinc, b-vitamins and iron which have all been shown to play a role in the preservation of muscle mass, cognitive function and appetite during aging. A recent study published in the “Journal of Clinical Nutrition” points to the physical benefits of consuming red meat as part of a well-balanced diet. Older adults who consumed at least 40 grams of beef per day experienced less weight gain and lost approximately 40 percent less lean mass than those consuming a low-protein diet. In addition to supporting physical function, the consumption of meat, especially red meat, may also help to maintain memory, reasoning and the ability to learn new information during aging. A study published in the “Journal of the American Geriatrics Society” demonstrated that participants who ate a diet rich in animal protein experienced less decline in social activity, intellectual skills and physical function and a decreased risk of dementia and Alzheimer’s.

The results of a randomized controlled trial published in the “American Journal of Clinical Nutrition” provide strong evidence for the inclusion of red meat as part of a healthy diet and exercise program. In this study, 100 women (aged 60-90) completed four months of strength training and ate either a standard diet or a diet containing one six oz. portion of red meat consumed six-days per week. The women consuming red meat gained more lean muscle mass and strength, produced more IGF-1 (a hormone important to muscle growth and brain function) and experienced a reduction in inflammation without experiencing any negative changes in cholesterol or blood pressure.

The results of several epidemiological and controlled trial studies suggest that the consumption of 3-4 servings of red meat per week as part of a diet rich in fruits and vegetables and an exercise program may benefit older adults by preserving muscle mass, enhancing physical function and preventing the decline in cognitive ability and neural health associated with aging without negatively affecting cardiovascular health. Heterocyclic amines (HCAs) are one of the primary carcinogens generated by processing/cooking meat. HCAs are not unique to red meat, and baking fish will actually produce more HCAs than baking beef. The more the meat is processed and the higher the cooking temperature, the more HCAs are generated. Therefore, to reduce HCA generation, food preparation methods that absorb or detoxify HCAs, such as lower cooking temperatures, slow cookers, marinating, rubbing with fresh herbs, turning meats more frequently to reduce surface temperatures, avoiding charcoal grilling and including side vegetable dishes rich in fiber and flavonoids are a simple means of reducing carcinogens.

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College of Science Alum Donates for Swain Hall Lab Equipment

Teresa Reed-Barnette’s endowment gift of $30,000 will provide for necessary equipment and technology for the microbiology teaching laboratory in Coastal Carolina University’s Kenneth E. Swain Hall in perpetuity. A 1997 Coastal Carolina University graduate, Reed-Barnette said, “Given the depth and quality of education Coastal provided me, I believe it prepared me for my first job out of college as a chemist in the candle research department of Bath and Body Works and later, as I founded my own company, Teresa’s Candles and Scents. It gave me the foundation I needed to enter the work world and the ability to thrive in an industry where being creative and thinking out of the box is critical to the success of the company. I was able to carry these things over into my own company as I created and developed new products.”

She also reminisced about her college days, remarking, “Whenever I think of Coastal, one of the things I reflect back on is the beautiful and peaceful, home-like feeling that accompanies being on campus. Also, when I attended, the class size was small, allowing teachers to provide individual attention when needed.”

Reed-Barnette created Teresa’s Candles and Scents in 2000, selling soy candles at craft shows, organizing candle parties and fundraisers, and selling to local people and businesses. She has an online store (teresascandles.com), and her products are sold in several stores around the United States. She has now added palm wax to her product line.

She is married to Doug Barnette, CEO of Player Management International, and is the proud mother of son, DJ, and daughter, Lauren.

Her gift is significant in that it will provide the necessary equipment for student research in the microbiology teaching laboratory, along with the latest laboratory technology as available. Reed-Barnette’s gift will make a positive impact on our students’ education and their future success.

College of Science Lecturer and Alum Endows New Scholarship

Chad Casselman, a 1998 CCU graduate who majored in computer science (and currently is a computer science lecturer) and minored in mathematics, has made a $30,000 gift, endowing a scholarship in computer science.

The scholarship, “B. Chad Casselman Computer Science and Information Systems Scholarship,” is for students seeking a bachelor of science degree in computer science or information systems.

Applicants for the scholarship are to be full-time new incoming students having a high school GPA of at least 3.0. A one-page essay must be presented stating his/her career objectives in computer science or information systems. The essay will be evaluated on the basis of the student’s ability to convey his/her professional ambitions in a clear, well organized and realistic manner.

Casselman has been a lecturer in the Department of Computer Science and Information Systems at CCU for six years. He is the CIO/co-founder of JVZoo.com, which began three years ago, and he has been the owner of Casselware, Inc., for the past 17 years.
Members of the Numbers and Bytes student organization took a private tour of Cisco headquarters in the Research Triangle of Raleigh, N.C., on Friday, Feb. 14, 2014. Cisco Systems Inc., is a Fortune 500 company and is a world leader in designing, selling and manufacturing networking hardware. Coastal Carolina University alumnus Derek Frimpong '12, arranged and gave the students the tour. Students were able to walk through one of Cisco's massive data centers while getting an understanding of the culture of working at Cisco. One of Cisco's partners, NetApp, also offered a tour of one of that company's data centers.

The next day, Numbers and Bytes students traveled to UNC Chapel Hill to attend TEDxUNC. TEDx allows speakers from around the world to come together and talk about “Ideas Worth Spreading.” This year's TEDxUNC conference was themed “Taking Flight,” and featured speakers and performers exploring how individuals, groups and ideas all metaphorically take flight. One of the speakers that Numbers and Bytes students were able to meet after the talks was NASA astronaut Jerry M. Linenger. He spoke to CCU's students, sharing his belief that the only thing better than being in space was spending time with loved ones and family.

The Numbers and Bytes club wishes to thank CCU College of Science Dean Michael Roberts, CSIS Department Chair Will Jones, Derek Frimpong of Cisco Systems, Diane Wilson of OSAL at CCU, the CCU Student Government Association, and everyone else who made this trip possible. Numbers and Bytes meets every Thursday at 6 p.m. in Room 203 of the Coastal Science Center.
by Kristi Forbus, MHA, Lecturer, Health Promotion and Health Administration

New opportunities for getting that Health Sciences degree are helping people like Tyrone Davis pursue the degree they want to help boost their careers.

The online program is for people who have completed an associate or four-year degree, are currently working full time and want to build upon their work and education to further their careers. Davis wants to build upon his associate degree and offered the following:

"I am 28 years old, married, with a daughter on the way, a full-time physical therapist assistant and a full-time student. Prior to entering the medical field, I spent three years in the Air Force, and I worked at the steel mill in Georgetown, which shut down in 2009. It was then that I knew I had to enter a field that presented me with a career versus a job, offered job security and countless opportunities to grow. Due to my current circumstances, attending school was the only option for me, and I am truly grateful that Coastal provided me with this opportunity."

"The primary reason I chose Coastal over other online institutions is because they offered exactly what I wanted for advancement in my professional career. Also, I am a recent graduate of Horry Georgetown Technical College, and CCU accepted the majority of my credits earned from HGTC."

"What I like most about the program is that despite being an online program, all professors are willing to meet with you as needed. The classes are very organized, and I feel as though I receive the same quality information as if I were in the classroom. Taking online classes also allows for flexibility, which is vital to someone who has responsibilities other than school to uphold. I feel confident and prepared that I will achieve my career goals thanks to this golden opportunity offered by Coastal. My future plans are to enter into the management and administrative side of healthcare."

We work with students to design schedules that ensure they complete all required classes in a timely fashion. More information about the online program can be found at www.coastal.edu/healthpromo.

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COASTAL CAROLINA UNIVERSITY NOW OFFERS AN ONLINE

Bachelor of Science in
Health Administration
Completion Program

Do you have an entry-level health degree, and would you like to continue your education? Are you interested in increasing your opportunity for management positions in the workplace?

The Bachelor of Science in Health Administration Completion Program (BSHA) builds on foundation courses in associate degree programs and other four-year degree programs. Graduates will be prepared for managerial roles and admission to advanced degree programs such as the Master's in Business Administration (MBA) or the Master's in Health Administration (MHA).

This online degree program is ideal for either part-time or full-time students. Applicants may be awarded a maximum of 76-90 credit hours for coursework completed prior to admission to the program. ADMISSION TO THE PROGRAM REQUIRES:

- An earned Associate degree or Baccalaureate degree from a regionally accredited college/university with a minimum 2.0 cumulative grade point average and a 2.0 grade point average in all professional and science courses.
- Completion of Core Curriculum (see CCU course catalog) for students who do not possess the A.A., A.S., B.A. or B.S. degree is preferred. (Statistics required)
- To apply, go to coastal.edu/admissions/apply.html.
- Applicants must submit the undergraduate application and final official transcripts from all colleges attended to the Office of Admissions.

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(left) Tyrone Davis working as a Physical Therapist Assistant.