

UNCG Research is published by
The Office of Research
and Public/Private Sector Partnerships
The University of North Carolina at Greensboro
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UNCG Magazine is printed on recycled
paper made with 50 percent de-inked
fiber, processed chlorine free.

18,000 copies of this public document were
printed at a cost of \$13,825 or \$.77 per copy.



THIS SPRING THE CARNEGIE FOUNDATION for the Advancement of Teaching released an extensive revision to how it classifies U.S. colleges and universities. UNCG is now listed as a Research University (High Research Activity). This classification puts us in the same company as Clemson University, the University of Oregon, the College of William and Mary, George Washington University and Wake Forest University. Now others will recognize what we've known all along: UNCG has a wide breadth of research activity, ranging from basic science to health to economic development. In this issue of UNCG Research, we share with you a few of the many exciting projects that have engaged our faculty.

More than half of the articles are health-related, reflecting the campus strength in this area. Projects range from understanding disease mechanisms at the cellular/molecular level to self-sustaining programs in the community. For instance, Dr. Michael McIntosh is investigating the role of specific dietary fats on the development of fat cells. This level of understanding is necessary to eventually control the obesity epidemic. The AD/HD Clinic, under the direction of Dr. Arthur Anastopoulos, serves the community as well as conducts pioneering research. The work of him and his colleagues to understand how genes impact the expression of AD/HD can potentially revolutionize its treatment.

UNCG faculty research also contributes critical information to understanding our environment. Dr. Anne Hershey's assessment of the health of river basins is crucial to protecting our water supply. Dr. Keith Debbage's work in urban development is essential to managing the changes occurring in the economic profile of the area surrounding the UNCG campus and serves as a model for similar changes nationwide.

Additionally, the arts define and enrich our campus. Billy Lee's bold sculptures have been exhibited worldwide. This year, the nationally acclaimed creative writing program was strengthened by the addition of Craig Nova, a prolific author of fiction.

Undergraduate students have always been closely integrated into UNCG's research program. One such example is the work of Christian Sykes, a senior majoring in mathematics, and his mentor, Dr. Jan Rychter, who conducted research on evolutionary game theory. To further strengthen the role of undergraduate students in research, Dr. Mary Crowe joined the campus faculty as the Director of the Office of Undergraduate Research in February.

UNCG is an exciting, evolving campus. Watch us grow.

ROSEMARY C. WANDER, PHD

Associate Provost for Research and Public/Private Sector Partnerships

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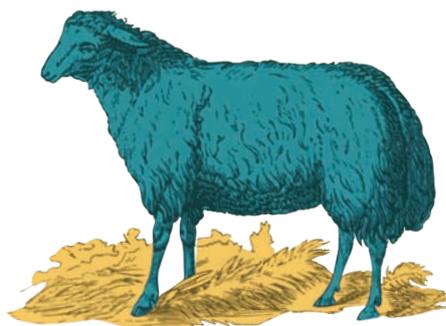
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Removing labels



It is possible that in a very few years the medical capacity for preventing all genetic forms of disability will be a reality. Is there a right to life for individuals with disabilities in this context? Will parents who may carry the genes for disabilities have the right of reproduction taken from them?"
 Dr. David Smith in his book, "In Search of Better Angels"

With an eye on the past, specialized education services professor Dr. David Smith asks some chilling questions of the future.

Smith has researched the history of mental retardation, eugenics and the mislabeling of people with disabilities. He believes great danger comes with using the label "mild retardation." About 50,000 people were sterilized in America in the early 20th century in the eugenics movement. They were not severely disabled, Smith said, but rather were simply poor, low-achieving or promiscuous.

"I really think that mild retardation to a large extent has been a myth that was created to cover a lot of human problems," he said. "It was a term applied to children who were problematic in some way. If we look at that category today, nationally, we would find inordinate numbers of minority children, particularly minority boys who fall in that category."

Labeling children carries meaning for teachers and health professionals, and labels can be used savagely by peers. "If you're called retarded that sends a message that's quite different than being referred to as having a learning disability, and it places you at risk for having

all sorts of educational and social consequences," Smith said.

Through his research, Smith met a man he calls Montgomery. Montgomery had Down syndrome and was called retarded. Asked if he could be granted three wishes, Smith said Montgomery asked for four — "ride a motorcycle, smoke cigarettes, look at Playboy if I want to and not be called retarded."

Smith is convinced the mild retardation label needs to be changed to something broader like intellectual or developmental disability. But given the rapid advances in genetic research, Smith said it is crucial that the entire perception of disabilities change.

"What's happening now is that we have genuine science that is telling us so much about the human genome, the genetic make-up of human beings and is allowing for the manipulation of the genetic nature of human beings," he said.

That, Smith said, brings more unsettling questions: "What is illness? What is health? If we are going to intervene to change people, what should we change and what should we not?"

Charting a course

AS JOBS IN TEXTILES and other manufacturing industries vanish, city leaders are fighting to reinvent Greensboro's economy. Increasingly, they turn to Dr. Keith Debbage, associate professor of geography, for help.

With expertise in urban planning and economic development, Debbage has emerged as an influential thinker in Greensboro. He has served as a consultant to business recruiters and planning officials on several major projects, including reports on the region's biotechnology, transportation and logistics sectors.

His latest project: serving as a policy analyst for a major land-use and transportation study, known as the Heart of the Triad project.

Debbage and others involved with the project hope to create a well-coordinated plan for economic growth on thousands of unde-



TIM RICKARD/NEWS AND RECORD

veloped acres in the middle of the Triad. With a FedEx hub under construction and a Dell manufacturing plant already operating in the center of the region, future development is inevitable, Debbage said. But residents and civic leaders can heavily influence the course that growth follows — and make the area

appealing to both families and top-notch employers — by planning ahead.

Debbage has been plotting a comprehensive map of all the building projects that are planned for this area — a resource that has not previously existed. It offers the best picture yet of how development is unfolding.

He, along with a team of experts, is recommending how this land should be developed in terms of road building, land use, zoning patterns, and even marketing strategies. He envisions "activity centers" that blend residential and commercial development, creating an inviting business climate and a high quality of life for residents.

"In terms of a project in our region, this is by far the biggest one I've worked on," Debbage said. "It's combining basically everything I've done for 15 years into one project."

The root of risky behavior

BEFORE JOINING UNCG as an assistant professor in the School of Nursing, Dr. Robin Bartlett worked for 14 years as a registered nurse. She spent 10 of those working with children and adolescents in psychiatric hospitals.

"I was concerned during that time about our very problem-based focus," she said. "We're always very concerned with what's wrong with kids, what's wrong with families."

Bartlett became intrigued with studies on what put kids at risk and what prevented them from developing problem behaviors.

Her study examines problem behaviors in adolescents and how they are linked to various risk or protective factors. Risk factors included low-self esteem. Protective factors included parental support and friends.

Bartlett mined data from the National Longitudinal Study of Adolescent Health. Researchers interviewed thousands of adolescents in grades 7 through 12 across the country in two waves between 1994 and 1996. Respondents were re-interviewed in a third wave in 2001 and 2002.

Bartlett divided the behavior into three clusters: typical, problem and deviant. Adolescents in the typical cluster engaged in few problem behaviors such as skipping school, being rowdy or using alcohol. Those in the problem cluster reported having multiple sex partners and not using contraceptives. Those in the deviant cluster also reported selling drugs and using weapons.

In the first year of the study, Bartlett found 73 percent fell in the typical cluster, 23 percent in the problem cluster and 4 percent in the deviant cluster. In the second year of the study, those numbers changed to 47 percent in the typical cluster, 45 percent in the problem cluster and 8 percent in the deviant cluster.

Among her findings: Adolescents in the typical cluster reported the highest self-esteem at both points; paternal support trailed maternal support in all the clusters and those in the deviant cluster reported lower parental support than others; and boys had higher self-esteem than girls in every cluster.

Recently Bartlett and her co-authors were awarded the D. Jean Wood Nursing Scholarship Award for a paper on this research from the Southern Nursing Research Society.



Brain gain

GROWING UP, DR. JENNIFER ETNIER was always involved in sports. As an adult, her interest evolved from strictly sports to the health implications of physical activity.

Specifically, Etnier studies how an active lifestyle improves the brain, from learning and memory to response time and moods.

Etnier, an associate professor in the Department of Exercise and Sport Science, studied 20 women with fibromyalgia syndrome (essentially chronic pain syndrome) during a year-long study funded by the university. Half of the group was assigned a moderate exercise routine. The other half began exercising after six months. Early data suggested a link between fitness level and cognitive performance. The mid-point of the study also showed that the women who exercised showed cognitive improvement — and reported less depression — while the inactive women showed no change.

Results from the final testing session were not available at the time of this story.

Etnier said older adults' chief fear is losing their mental abilities. Because the population is aging, and because more people are working longer, it is imperative that researchers understand the link between physical activity and mental health.

"Anything we can find out about behavioral interventions that might promote cognitive function or prevent declines will have important implications for a large group of people."

Even short bouts of exercise carry big benefits. Her study of 16 men and women 55 and older showed

participants who walked on a treadmill for 20 minutes performed better on cognitive tests than older adults who read a book for 20 minutes.

The benefits started five minutes after the walkers stopped and continued up to two hours. "I was surprised at the duration of the response," Etnier said. "I wasn't surprised that there was a response."

Etnier hopes to get a \$1.5 million grant from the National Institutes for Health to study physical activity and Alzheimer's disease. She believes fitness routines could be most helpful for people at greatest risk for the mental disease. People as young as 30 who have the genetic marker for Alzheimer's already show structural differences in their brain, she said. The study could show people at risk for the disease who exercise in their 30s build better brain protection for their 60s.

The sound of hearing loss

AS AN AUDIOLOGIST, DR. SUSAN PHILLIPS often worried about her teenage son listening to loud music that could damage his hearing.

But it wasn't the typical rock concerts or blaring radios that concerned her. She actually worried about the classical musical classes he took at UNCG's School of Music.

Turns out she was right.

Her research, part of UNCG's Music Research Institute, has shown that sound levels in music practice rooms average about 88 decibels, high enough to trigger an OSHA investigation in industry, and can peak at 130 decibels, equivalent to an airplane taking off.

"I read somewhere that orchestras are as loud as a rock band, and it really grabbed my attention," said Phillips, an associate professor of audiology in the Department of Communication Sciences and Disorders. "I thought we should check to see if these students are getting overexposed."

Phillips tested the hearing of 108 undergraduate music students, all of whom volunteered for the study. Forty-eight percent had a "notched" audiogram, which indicates noise-induced hearing damage, or a drop in sensitivity to a particular pitch.

This year, Phillips has extended her study to all music students. Already, about 70 percent of freshmen and sophomores show signs of hearing damage.

"Even a small amount of this type of hearing loss might change

their pitch sensitivity, which as you can imagine is crucial for a musician," Phillips said. These students can also have more difficulty hearing amid background noise.

Because of the evidence of hearing damage, the School of Music is considering establishing a hearing protective policy, which would require students to have their hearing tested every year. It may also provide students with musicians' earplugs.

To further her research, Phillips recently started asking the students she tests about their family history of hearing loss and music study. Next year, she plans to work with Malcolm Schug, an associate professor of biology, to probe the genetic causes of noise-induced hearing loss.

Phillips said the sheer number of music students with some hearing loss surprised her.

"From the viewpoint of an audiologist, it's just scary to think that they're doing this to their ears. It's damage to the inner ear, and that's permanent. There isn't a darn thing you can do about it. And it's so insidious because it doesn't literally hurt. You don't know it's happening until it's too late."

The truth in trees

LONGEVITY EXISTS THROUGH ADVERSITY.

Dr. Paul Knapp's study of tree-ring data from the ponderosa pine and western juniper trees seems to prove it. These species, which grow in harsh, arid conditions, can live to be 800 and 1,600 years old, respectively.

Knapp, a geography professor, has long been fascinated with dendroecology — the study of trees and their environments. He uses tree-ring data to help unlock the mystery of past climatic change, looking for patterns of drought and growth that may be repeated. His research could have long-range implications for managing the ecosystem in the western United States.

A native of Corvallis, Ore., Knapp heads west each summer, hiking to forests that have had minimal fire suppression, grazing and cutting. He extracts core samples from trees at least 300 years old and examines their rings. Years with favorable climatic conditions are noted in wider rings.

"Tree ring data allow us to document conditions with annual precision," Knapp says. "We can extend the climatic record back hundreds and, in some places, thousands of years."

In one project, Knapp reconstructed the climate during the travels of Lewis and Clark, finding they had a fortuitous journey — capitalizing on

an unusual period without severe drought or extended wet conditions.

Knapp's research also has helped identify zones where droughts are more common and last longer. "Some rapidly growing cities exist in dry climates," he said. "These studies show that you can have extended dry periods, which can present severe water shortage problems."

In addition to droughts, Knapp has examined how some trees have responded to increased atmospheric carbon dioxide levels during the past century, a phenomenon caused by fossil fuel combustion and deforestation. Increased carbon dioxide seems to help western junipers and ponderosa pines use water more efficiently.

"This can lead to a longer growing season — as an analogy, these trees are getting better gas mileage," Knapp says. As the trees are able to grow in drier conditions, the treeline could eventually drop to lower elevations, changing the composition of entire ecosystems.

Knapp's future research will look at windstorms along coastal Oregon and Washington — events that also leave their mark in tree rings. As with drought and wet cycles, these patterns of high winds could have implications for tree growth, fire cycles and even the lumber industry.

"Patterns repeat themselves," he says. "The fact that it has existed means it could happen again."

Sometimes stealing can be a good thing.

Since the summer of 2005, Christian Sykes, a senior mathematics major, has been studying kleptoparasitism (food stealing) in gulls by using evolutionary game theory.

Evolutionary game theory is an offshoot of classical game theory, which is a study of human behavior that involves mathematics and economics and assumes that individuals in a population make the best choices.

Taking it a step further, evolutionary game theory assumes changes in behavior are a result of changes in the environment. A population adapts to a situation over long periods of time in order to survive.

Sykes' study, under the direction of math professor Dr. Jan Rychtar, has examined gull populations with identical (monomorphic) characteristics and has found that the fitness of individuals in a population is related to the time it takes to acquire food sources. The longer it takes an individual to find food, the less fit they are.

Gulls exhibited four kinds of behaviors in this study: that of hawk, dove, marauder and retaliator. Hawks always attack for food and always resist being attacked. Doves never resist and never attack. Marauders always attack yet never resist. Retaliators never attack but always resist attack.

He has found hawk and marauder behavior to be the most stable, meaning that when a species arrives at that behavior, it does not change. In a monomorphic population it is almost always advantageous to steal.

The next phase is to study a polymorphic population. This time Sykes will see if avian thieves find the same advantage in stealing from birds less like themselves.

The genetics of AD/HD

DETERMINING THE ROLE THAT GENES PLAY in attention-deficit/hyperactivity disorder — or AD/HD — is the goal of a five-year, federally funded collaborative study led by UNCG's Dr. Arthur Anastopoulos and researchers from Duke University.

Anastopoulos, a professor of clinical psychology and head of the university's AD/HD clinic, hopes to disentangle the genetic understanding of the disorder that is marked by inattention, hyperactivity and impulsiveness.

AD/HD affects up to 5 percent of schoolchildren and up to 4 percent of adults.

Anastopoulos is collaborating on the study with researchers at the Center for Human Genetics and the Department of Psychiatry at Duke University.

"Most genetic research these days has tended to view AD/HD as a homogenous condition," Anastopoulos said. "But our point is it's heterogeneous and varies along several important clinical dimensions."

About 30 genetic markers, or abnormal gene patterns, have been linked with AD/HD. Researchers do not know why there are so many, Anastopoulos said. "We're trying to impose a little bit more precision in how AD/HD is defined in order to say which genes go with which clinical presentation," he said.

People with AD/HD can show differing features: some are inattentive types while others are inattentive and hyperactive. Some have learning disabilities, depression and anxiety as well as typical AD/HD markers. Additionally, AD/HD can change with age. A child with primarily inattentive AD/HD could, two years from now, show hyperactive impulsive features as well.

Results of the study could change treatment for AD/HD because genetic markers could signal the most effective medication.

Researchers will test blood samples from more than 300 children ages 5 to 13 twice — with a two-year interval. A third of the children will be tested at the UNCG clinic, the remainder at Duke. The parents and siblings of the participants will also be tested.

Anastopoulos said the first phase of the study could be complete in 2007.

Anastopoulos is also working with Duke on a study that tests the common perception that college students are misusing stimulants used for AD/HD treatment to stay awake. Researchers surveyed incoming freshmen at Duke and UNCG. They asked the students whether they know people using such drugs as Ritalin, Concerta, Adderall and Methylin who don't have AD/HD, and whether they know people selling their prescriptions.

Researchers plan to re-interview the 1,500 respondents next year to see whether their perceptions have changed.





Joint resolutions

Research Excellence Professor Dr. Sandra Shultz studies a problem that has plagued female athletes for years — why do a greater number of women than men tear their anterior cruciate ligament (ACL)? And what can be done to prevent it? Shultz, an associate professor in the School of Health and Human Performance, has been working on this question for the last 10 years.

WHAT IS THE ACL: The ACL — the anterior cruciate ligament — is one of the major stabilizing ligaments in the knee. It's important for controlling excessive motion in the knee, especially during landing, cutting, sudden stop-and-start kinds of maneuvers.

WHY STUDY THIS AREA: I worked as a certified athletic trainer for women's basketball at UCLA for five years, and we had our share of ACL injuries. That puts an athlete out for an entire season and sometimes they never go back to the same level they were before. So my interest was in how we can stop those injuries to begin with.

AREAS OF FOCUS: It's a complicated issue and there's probably not one single answer for it. ... The two areas that I focus on are the anatomical and the hormonal differences between males and females, and how these differences influence how the knee joint functions during dynamic activity.

THE ROLE OF HORMONES: About a year ago HHP Dean Dave Perrin and I finished a three-year National Institutes of Health study that examined how knee laxity changes across the menstrual cycle in women. We found that after ovulation and early in the second half of the cycle, once estrogen rises, there is an increase in knee laxity. The interesting thing about this is not all the women experience these cyclic changes in knee laxity. While some people have a dramatic increase in knee laxity others really showed no change.

NEXT STEPS: Right now, we're at the "so what" factor. Now that we have observed these increases in knee laxity across the cycle, does this have an effect on how the knee joint functions during sport activity? So the next step is to do some neuromuscular and biomechanical studies to examine that. We want to compare those who have relatively greater knee laxity and those who experience knee laxity changes across their cycle to those who do not by measuring their muscle activity, their joint motion and their joint forces during weight-bearing activity. Do we see greater displacements in the joint? Do we see the muscle having to work harder to stabilize the joint as a result of this increased knee laxity? It may be that the body compensates very well for this increase in laxity or it may put the knee at greater risk.

WHY THIS AREA OF STUDY MAY BE CONTROVERSIAL: I don't think people want to hear that hormones may play a role in ACL injury. And there are conflicting studies in the literature. Some say knee laxity doesn't change; others say it does change. I think it really might have to do with when the measurements are taken and the fact that not all women experience these changes. Also if it's just about hormones then one would expect every female to tear their ACL, and we know that doesn't happen. However, we need to appreciate that not all women experience the same hormone profiles, and our research suggests that the knees of some women are more responsive to hormone changes across the cycle than others. We may need to focus on the women who demonstrate these changes and see how they're responding differently because we know that not all women tear their ACL. So the next question is, does an increase in knee laxity put them at greater risk?

PREVENTION: We know that preventative training programs work; we just don't know what exactly we're targeting at this point. I think if we can stay devoted to identifying the risk factors that cause ACL injury, then we can be more specific and effective in our training programs. That's ultimately where we need to go with this.

Going global

Research Excellence Award winner, Dr. Prashant Palvia, the Joe Rosenthal Excellence Professor in the Bryan School of Business and Economics, has been at UNCG for six years. In that time, he helped establish a PhD program in Information Systems, the only one of its kind in the state; edited the Journal of Global Information Technology Management; and has set to work to create a Global Information Technology Center. Initially the head of the Department of Information Systems and Operations Management, he moved to become the director of the PhD program in Information Systems, allowing him more time for research in global information technology management.

DESCRIBING INFORMATION SYSTEMS IN LAYMAN'S TERMS: Information systems, in a nutshell, deal with the application of computers and information technology to business and organizational needs. It's more about the applications and the use of technology, rather than the computer hardware, software, and technology per se.

RESEARCHING HOW COMPANIES BUILD GLOBAL INFORMATION SYSTEMS:

We identified eight different approaches which companies use to develop IS applications. For some, it was not a strategic decision at all, meaning companies did not necessarily say in the beginning, 'OK, we're going to use this type of strategy and stick with that.' We found these applications typically take one to three years to build. As they moved along they found they needed to make changes in their strategies. And they did. We found they made two, three, even four changes during development. It was not a static but more of a dynamic decision.

WHY A GLOBAL FOCUS? One thing I found in my almost 15 years of conducting research in global information systems is we tend to be very ethnocentric, very U.S.-based in our research. We need to go beyond that. What we learn may not necessarily be applicable in other parts of the world. That observation is what's basically driving my research.

WHERE HE WANTS HIS RESEARCH TO GO: We have looked at some other countries. I was able to classify countries into four categories [advanced, newly-industrialized, developing, under-developed]. ... We want to study the issues methodically where we use a uniform methodology in maybe 10-12 countries every three years or so. ... What are their major concerns, major issues, and how do they evolve over time?

WHY HE CLASSIFIES CHINA AND INDIA AS DEVELOPING COUNTRIES: China and India — they are fast developing and will soon catch up with the advanced nations. I can speak for India being that I was born there. They sort of have two tiers of populations, if you will. The one tier is the advanced and doing pretty well in terms of their use of technology. And then there are the masses who are very primitive in the use of the technology. I know that's true for China too. ... That would be a great area of research — how do we bring the masses up and have them experience the technological revolution? They often get left behind.

ON THE GLOBAL INFORMATION TECHNOLOGY CENTER HE HOPES TO CREATE: We will look at issues and problems at the international level. And we'll also look at how we can help companies in the Triad and North Carolina so that they can work internationally in terms of their IS issues. Our primary goal will be research but our secondary objective will be a more practical orientation in terms of being able to help them.

THE BENEFITS OF A GLOBAL SOCIETY: With technology, frankly, we're not really an isolated world. The world is our forum. So I don't think we can continue to afford to be U.S.-centric. We really need to understand the issues and the challenges. ... If we are a truly open and capitalistic society, that's where we're headed — to a global society. It's going to cause some short-term pains and bumps but I believe personally, over the long term, it's going to be a win for all — the U.S. and the rest of the world. 🗎



FATPHARM

Is conjugated linoleic acid (CLA) a magic formula for weight loss? CLA has been shown to cause mature fat cells to shrink, but Dr. Michael McIntosh warns too many questions are unanswered.

DR. MICHAEL MCINTOSH OF THE DEPARTMENT OF NUTRITION is a broad-shouldered man with a rock-hard handshake and the look of extreme fitness.

A nutritionist and registered dietician, McIntosh works out regularly, watches what he eats and preaches moderation as the key to staying healthy.

Curiously, his research focuses heavily on conjugated linoleic acid, a naturally-occurring fatty acid that is sold commercially and hyped as a “miracle” weight loss pill. Advertisers boast that CLA promotes weight reduction and increases muscle mass.

Don’t believe the hype, says McIntosh, who recently directed a four-year study of the role CLA plays in shrinking fat cells and inhibiting fat cell growth.

“I wish there was a magic formula, but I think it’s moderation,” he said. “I have to work out every day. It’s really a question of moderation and lots and lots of physical activity.”

McIntosh’s research has serious implications for obesity management. Statistics show that 64 percent of American adults are overweight and nearly half of those are obese, according to the Centers for Disease Control and Prevention. Fifteen percent of children ages 6 to 11 are overweight as are 15 percent of adolescents ages 12 to 19.

If scientists identify how CLA works, they might be able to create a similar substance to treat obesity without harmful side effects.

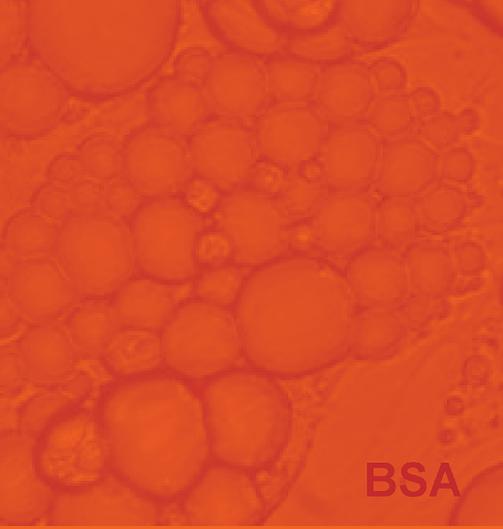
CLA is found mostly in dairy products from ruminant animals including cows, goats and lambs, and it is passed on to humans when they eat these products. CLA is a byproduct of the fermentation process that occurs in ruminants — animals with a special digestive system.

At least 28 varieties of CLA exist but the most abundant isomers — compounds that have the same kind and number of atoms but differ in the atomic arrangements in the molecule — in animal products are the *cis-9, trans-11* isomer, which accounts for about 80 percent of the isomers, and *trans-10, cis-12*, which accounts for about 10 percent.

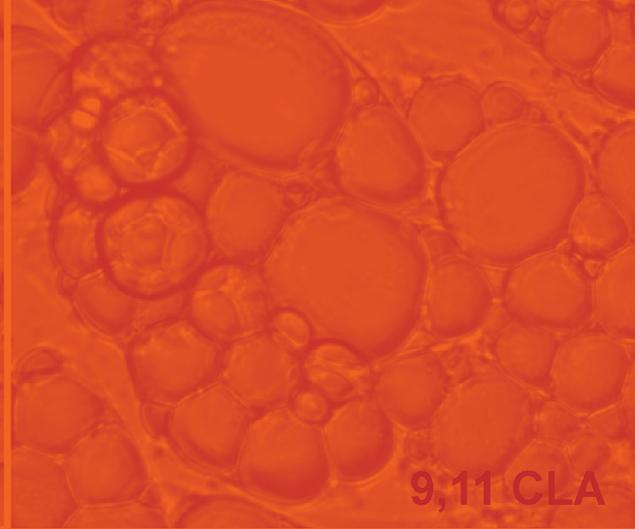
In their lab in Stone Building, McIntosh’s students and a technician inject a concentration of 30 micromolar of chemically-processed CLA into human fat cells under the skin (CLA in

BY DANA DAMICO
ILLUSTRATION BY MITRE DESIGN

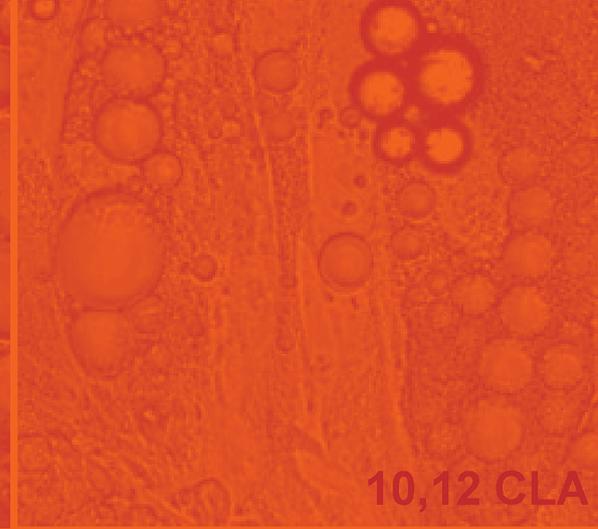




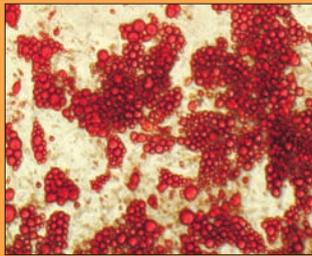
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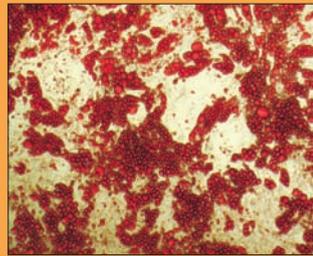
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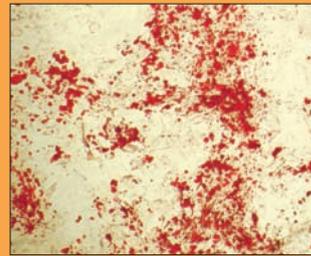
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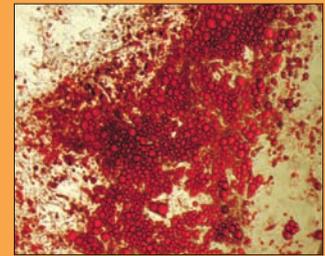
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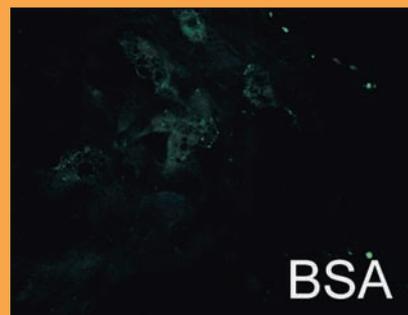


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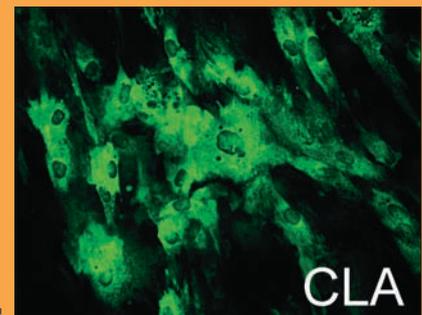


10,12 CLA + ROSIGLITAZONE

Trans-10, cis-12 CLA's suppression of lipid content is reversed by the hypoglycemic, anti-diabetic drug Rosiglitazone



BSA



CLA

Trans-10, cis-12 CLA increases the levels of p-Ikk, a marker of inflammation, in human adipocytes

human blood levels ranges from 10-70 micromolar). The fat cells, which are stored in liquid nitrogen, come mostly from abdominal tissue.

The first indication that CLA affects the cells can be seen just three hours after injection. “We see this through our markers, the assays that we do, to measure cell signaling,” McIntosh said.

McIntosh’s team has found that *trans-10, cis-12* CLA — not *cis-9, trans-11* CLA — inhibits baby fat cells from filling with fat and causes mature fat cells to shrink. When *cis-9, trans-11* CLA is injected by itself, fat cells actually grow, McIntosh said.

The shrinkage of the fat cells is due largely to the suppression of glucose and fatty acid uptake. “We think it changes the signals within cells to stop taking up glucose and fatty acids — hence the triglycerides — and that’s why the cells get skinnier,” he said.

The bad news is the body needs a place to store the extra energy it consumes. Glucose and fatty acids are the building blocks of triglycerides, the storage form of fat. If CLA prevents the formation of triglycerides, then fat circulates in the blood where it can be taken up dangerously by organs.

One clinical study showed that the *trans-10, cis-12* isomer reduced body weight but it worsened patients’ diabetes, McIntosh said.

The CLA suppression of glucose and fatty acid uptake is also associated with the secretion of pro-inflammatory cytokines, McIntosh’s team has found. The inflammatory hormones cause hypertension, diabetes and atherosclerosis, which is the accumulation of lipids in arteries that leads to plaque formation.

McIntosh is submitting a manuscript for publication on this issue.

When he adds several types of pro-inflammatory agents to human fat cell cultures, the inflammatory response is “huge.” One study shows that morbidly obese people produce more inflammatory cytokines than moderately overweight people, he said.

“It’s one of the hottest areas in obesity research,” McIntosh said.

Exactly what makes *trans-10, cis-12* CLA trigger cytokine production and impair glucose and fatty acid uptake remains unclear.

McIntosh is seeking a five-year, \$1.6 million grant from the National Institutes of Health to study the mechanism that makes it happen. He wants to identify the molecular events that occur in the first three hours after CLA is injected.

Currently, CLA is sold as a dietary supplement at health food stores and online. Most supplements advertise that they contain equal parts *trans-10, cis-12* CLA and *cis-9, trans-11* CLA.

McIntosh warns that the supplements are totally unregulated by the Food and Drug Administration, and their effectiveness in humans is unproven.

“People can say they do all of these wonderful things,” he said. “All of them can be snake oil.”

One maker of CLA suggests that the supplements could improve immune health, heart health and the maintenance of normal blood glucose levels, according to its marketing materials.

McIntosh said at least 10 human studies show consuming CLA supplements caused some weight loss or fat loss, but another 20 studies indicated it did not reduce body weight or fat in humans. Ninety percent of animal studies show weight loss but the animals are given much greater quantities of CLA, he said.

Potential adverse side effects and too little information on the efficacy of the supplement make it difficult to advocate using it, he said.

McIntosh said many questions remain unanswered. If CLA decreases body fat, then how much and which type of isomer does one need to take daily? When would CLA be contraindicated? What is the most reliable source of CLA? What are the potential side effects? Will taking enough CLA reverse or decrease obesity without side effects?

McIntosh’s interest in both nutrition and teaching coalesced continents away in the small West African country of Cameroon. McIntosh worked in the French-speaking country as a member of the Peace Corps from 1974-78.

During his first year there, McIntosh volunteered to fill in for a missionary teacher who fell ill. His short stint teaching English to seventh- to ninth-grade students actually lasted three months, and he got the itch to teach from that experience. “That’s when I got excited about teaching,” he said.

He was also exposed to nutrition for the first time when, as an inland fisheries volunteer, he helped build small lakes and big fish ponds. He taught people on the country’s northern plateau to raise tilapia, an algae-plankton feeder that thrives in ponds with little oxygen.

McIntosh, who has been teaching at UNCG since 1989, describes his position as the principal investigator of a team of researchers. That team is currently comprised of graduate students Soonkyu Chung, Arion Kennedy and Amanda Troy; undergraduate student Kristina Martinez; and Kathy LaPoint, a research technician III whom McIntosh supports with funds from his grant proposals.

McIntosh said his students design the experiments, treat cultures and harvest cells, conduct assays that measure the outcomes of treatments, analyze data, and prepare data for presentations and publication in peer-reviewed journals.

He said his job is to find money for research, mentor the students during their research training and coursework and help them transition into their next professional endeavor.

He loves his work. “I never really questioned doing something else,” McIntosh said. “It’s not a job. It’s more like a profession that I enjoy — both the research and the teaching.”

BY SEAN OLSON, STAFF WRITER
PHOTOGRAPHY BY DAVID WILSON, STAFF PHOTOGRAPHER

THE PERFECT FORM

FOR DEPARTMENT OF ART PROFESSOR BILLY LEE, research is less likely to include a lab coat than a pair of plaster-spattered coveralls. He doesn't stock beakers or centrifuges in his studio, but he's got plenty of molds, models and a hell of a lot of intensity.

Sure, he's worked with ALCOA Aluminum on metallurgy research because he was interested in the light fragmentation of metal surfaces for sculptures. He's also studied as a fellow at one of the world's premier engineering schools — the Massachusetts Institute of Technology.

But for Lee, research also means observing, seeing things and noting them, even mundane or ordinary things: the way a building presents itself on the horizon, the simple sexiness of a disc.

"The term 'research,' for me, evokes a methodical and systematic gathering of information which is subsequently evaluated according to a process characterized by logic and analytical rigor," says Trevor Richardson, curator and critic. "Artists, for the most part, work in a much more intuitive way. They amass information in a more random, associational fashion than their scientific peers."

Experience, Lee believes, informs art. And then art informs itself.

Take "Eos," a piece that Lee did in Guilin Yuzi-Paradise Sculpture Garden in China. The 27-ton piece includes two simple discs or wheels that, on the interior, have slight and smoothly worked convex portions. That piece inspired Lee to use discs to explore the sensuousness of simple objects in another piece.

"Right now, I've stopped working on what I call the big head pieces [such as "Eos"] because I'm working on this," Lee says, touching a small piece, which looks like two discs, the size of dinner plates only thicker. The discs are part of a piece he is working on for a proposal for a sculpture park in Shanghai.

Lee sees something wonderful in taking inert, hard material such as granite and transcending that hardness by sculpting it into a something that is sensuous without being figurative.

"I really like this piece," Lee says, gently touching the discs. "The interior is remarked by a smoothness. It's very sensual, like a breast or buttocks. Outside, it isn't worked. It's rough. I'm interested in that, the idea that from such a simple form, you can get that sense, that sensuousness."

Pop-artist Andy Warhol believed the more he looked at things, the more likely they were to lose all meaning whatsoever. Lee believes that the more one looks at something, the more it changes.

Billy Lee's studio (right) is an assemblage of cake pans, plaster and works in progress. His sculptures play on the ideas of form and sensuousness.



“Perception and observation are ongoing and always challenging,” Lee says. “One is constantly honing one’s perception through observation.”

Dr. Carl Goldstein, professor and coordinator of art history at UNCG, agrees.

“This study of form, your eye for form, is constantly being refined. It’s not something you are born with. It’s something you have to work at, pay attention to,” he says.

The practicalities of Lee’s art can be difficult. The margin of error for 27 tons of granite is much different than say, a canvas and paints. You don’t just take a block and start cutting.

Lee starts by making small-scale works. Take that convex shape on “Eos,” which he is using in the other piece, a pair of discs between which a human figure is suspended. He uses plaster to make models. But, to get different curves, he uses somewhat unusual research tools: various-sized cake pans to make the discs, and several different bowls and woks to mold the plaster and get just the right curvature.

It’s all part of the process, Lee says.

“It takes so long to kick the idea around. It’s just in your head, you know? But this is a way to kick the idea around.”

GETTING HIS HANDS ON ART

As a child growing up in England, Lee had no idea he would study art. He didn’t come from a family of artists. When he was in “state school” (high school), he was more interested in shop than almost anything else.

“I’d always made things and enjoyed making things with my hands, so I was always more interested in these vocational classes. Shop classes,” he says. “I guess I enjoyed making those sorts of things and excelled at it. But an art master introduced the idea of going to art school where I could continue to work with my hands.”

Sure, he holds a BFA from the Birmingham College of Art and Design, and an MFA from the Royal College of Art in London, Britain’s premier art school. But he is also the only artist to be named a Kennedy Scholar. The Kennedy Scholarship is a British fellowship in honor of John F. Kennedy that funds students’ post-graduate studies at Harvard University or MIT.

Lee spent time at MIT’s Center for Advanced Visual Studies, to which he and 12 other fellows from various art disciplines were invited to work on collaborative projects in art, science and technology.

Given this experience, Lee sees a lot of crossover between architecture, engineering and art.

“When you look at sculpture in the larger sense, it seems like it encompasses all of these things. Pure engineering is a kind of abstract creative process. As a visual artist, I think there is more in common than uncommon with, say, engineering or architecture.”

Engineers have worked with Lee to certify his calculations of the load-bearing strength of certain sculptures, to calculate wind-bearing or to calculate materials’ ability to withstand earthquakes. He often talks with architects about things such as the strength of certain kinds of concrete.

That very analytical side — that MIT side — seems to heavily influence his work; some of it looks almost engineered with its straight and hard lines and edges, its severe angularities. And, yet, in the hard granite among the geometric forms, Billy’s work has a smoothness here, a rounded edge that makes it ... well, human.

His work has certainly found favor in the art world. It is shown around the globe, from Greensboro to as far away as Japan, China, Hungary and Britain. He’s held solo exhibitions at the Royal Society of British Sculptors in London, the MB Modern gallery in New York, the Galeria Zero in Barcelona, Inoue Gallery in Japan, and taken part in group shows at the Guggenheim in Venice — just to name a few.

FORMS AND ABSTRACTS

Looking at images of Lee’s mammoth art that rests in a sculpture park in China, the forms are heavy and seem abstract and daunting. But then ... a head appears, a torso ... large discs or wheels are legs. And, suddenly, it occurs to you — these aren’t things. They are human. Or almost human. They are gods.

In that sense, he seems to have mastered the delicate balance of spanning abstraction with the figurative.

“The syntax the sculpture employs may still be essentially minimalist, but Lee has infused it with a subtle, anthropomorphic presence,” Richardson wrote of Lee’s work in *Sculpture* magazine.

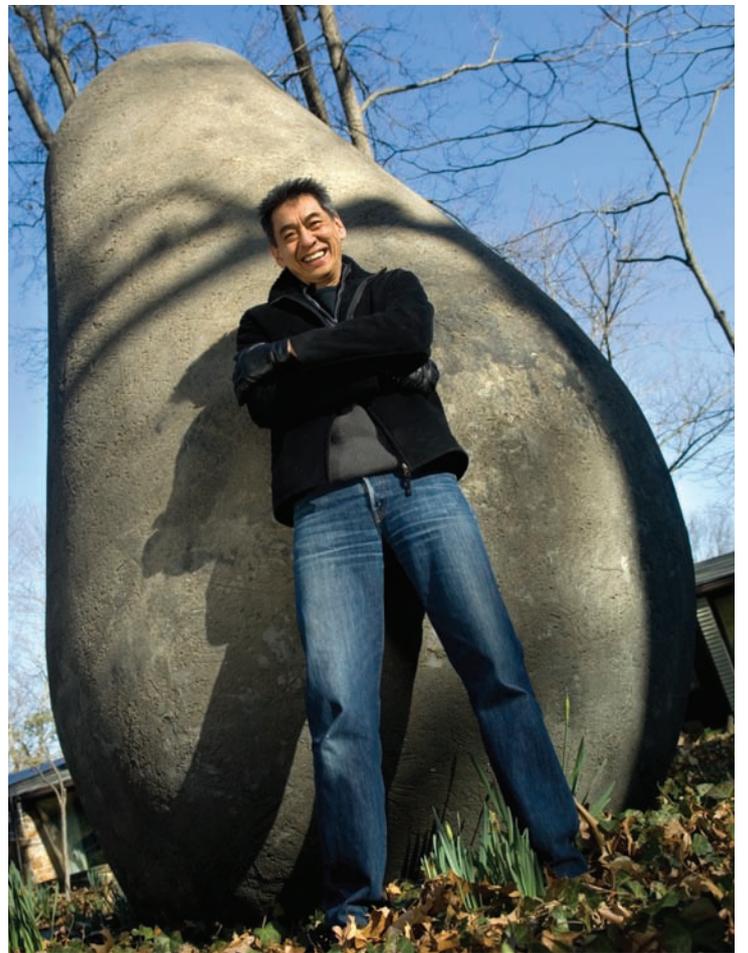
“Billy’s training had to do with recognizing differences in form, and exploiting those differences, doing something different with that. That’s something that’s very ... complex,” says Goldstein.

Given his teaching schedule and the medium Lee has chosen to pursue, it’s amazing that he has done so much.

Lee will continue his work in several weeks when he travels again to China to start on a number of pieces for a solo exhibition that will be shipped back to the states.

“Making sculpture is physically exhausting, and Billy works all the time,” Goldstein says. 

1. **EOS** 2004, Black granite, Memorial Rose Garden, Chin Pao Shan, Taipei, Taiwan. Permanent Collection. 2. **BIGHEAD** 2005, 16' height, Black Granite, Goodwood Sculpture, W.Sussex. UK. Permanent Collection. 3. **UNTITLED** Greensboro, Collection of Jane and Richard Levy. 4. **KISS** 2005, 80" dia., Black granite, Cuilin, China. 5. **MATTHUIS REX** 1996, 18' x 15' x 35', cast iron and steel, Dunaújváros Sculpture Park, Hungary. Permanent collection. Photos 1,2, 4 and 5 provided by Billy Lee.



Water's long, strange trip

Every drop of water has a story.
If it could speak, it could recount tales of the
lands it has traveled,
the organisms it has harbored,
the part it has played in sustaining
the web of life.

Dr. Anne Hershey, a biologist who has
studied lakes and streams from areas
both bustling and pristine,
is interested in the story a drop of water can
tell about how its travels alter natural cycles.
What living things are surviving within?
How plentiful are they? How are they
changed by its journey through the
landscape? What nutrients does it contain
and are they in balance?

The life story of a drop of water is
inextricably linked to our own. After all, only
1 percent of the earth's water supply is fresh
water, and as the population grows,
this limited resource is constantly impacted
and placed in greater demand.

BY TIFFANY EDWARDS

GREENSBORO PHOTOGRAPHY BY LEE ADAMS

ALASKAN PHOTOGRAPHY BY MATT KEYSE

This page, an Alaskan landscape
Facing page, North Buffalo Creek, Greensboro



Urban streams are unlike their rural cousins. “There are a lot of things missing that result in loss of function. There is low biodiversity. If you sampled a forested stream, you might find 100 or more species of invertebrates and a few dozen species of fish. In an urban stream, you find a few dozen invertebrates and less than a dozen species of fish.”

In the past, scientists studying lakes and streams have usually focused on the water-body itself, rather than thinking of it as an integrated part of the landscape. Through a series of studies in North Carolina and Alaska, Hershey is looking at the way freshwaters are affected by the land that surrounds them. For example, it is well known that the biological health of a stream suffers when it flows through an inner-city park, rather than a forest glen. However, it is not known whether and to what extent an urban stream can recuperate after government restoration projects return its banks and bottom to a more natural state. In addition, can a stream recover from point-source effluents, such as treated water from sewage treatment plants? Hershey hopes to learn more about the resiliency of freshwater systems in light of such factors. Far away in Alaska, she is looking at what changes occur in the biology of a lake when global warming transforms the surrounding tundra from grassland to shrub-covered hills.

LIFE AS AN URBAN STREAM

Urban streams are unlike their rural cousins. Storm water, which is funneled into the streams through a system of gutters and pipes, fills urban streams with sediment, and the swift-flowing water cuts deep into the banks. Straight, sand- and silt-bottomed streams tend to have higher temperatures, offer few places for fish and other organisms to live, and clog the gills of fish and the invertebrates they would feed on.

“There are a lot of things missing that result in loss of function. There is low biodiversity,” Hershey said. “For example, if you sampled a forested stream, you might find 100 or more species of invertebrates and a few dozen species of fish. In an urban stream, you find a few dozen invertebrates and less than a dozen species of fish.”

Because the water runoff from pavement does not pass over tree roots to be filtered, it carries pesticides and nitrogen- and phosphorus-rich compounds such as lawn fertilizers, sewage overflow and animal manure into streams. Healthy streams have the capacity to absorb some such pollutants from the land. However, in urban environments, the streams are overwhelmed by the abundance of incoming nutrients. As the streams feed into larger waterways, the problem increases exponentially. In North Carolina, for example, nitrate-rich water at the end of the Cape Fear River basin provides a hospitable environment for *Pfiesteria*, a toxic alga that has been blamed for fish kills and human health problems.

In the past few decades government officials have begun to mandate stream restoration and require controls on pollutants in streams. The restoration projects usually require the regrowth of trees and other vegetation along stream banks (riparian zones), the rebuilding of bends in the stream (meanders), and the introduction of rocks, which provide essential habitat for fish and invertebrates. The projects are costly. In a 2004 report, the N.C. Ecosystem Enhancement Program estimated that the state’s 19 urban stream restoration projects cost an average of \$201 per foot to complete.

Few scientists have studied how effective these well-meaning measures have been. Hershey is leading a team of students to determine precisely what effects development has on streams and whether resto-

ration effects are successful countermeasures. Their efforts have been funded by the Water Resources Research Institute and the Julia Taylor Morton Endowment Fund.

North Buffalo Creek, which flows through Greensboro, is among the headwater streams of the Cape Fear watershed. It was identified as impaired in the Cape Fear Basinwide Water Quality Management Plan in 2000. The study cited in-stream habitat degradation, impaired biological communities and the presence of fecal coliform bacteria.

In an article published last year by the North American Benthological Society, Hershey and student A.J. Ulseth reported the results of an examination of nine sites along North Buffalo Creek. Selected on the basis of how the land next to the waterway was being used, the sites stretched from Hamilton Lakes Park to Rankin Mill Road and encompassed the waters upstream and downstream of the North Buffalo Creek Waste Water Treatment Plant.

The water in North Buffalo Creek downstream from the water treatment plant contains about 50 percent treated sewage. During the water treatment process, Hershey said, most of the carbon (organic matter) is removed from the water but most of the nitrogen remains. In fact, the nitrogen content of the water downstream from the treatment plant tested as much as 10 times higher than the water sampled upstream of the plant. The water samples were taken about every two months from June 2001 to June 2002. Hershey and her students are studying what happens to all that nitrogen in the stream, by measuring how much of it can be processed by the stream biota.

In addition to studying the consequences of point-source effluents such as the water treatment plant, her students are also looking upstream of the plant to gauge North Buffalo Creek’s health after restoration efforts. Graduate student Robert Northington examined fish populations in restored and unrestored sites and discovered that while there were more fish in restored sites than in unrestored, there still weren’t as many fish as one would find in a forested site. Another student, Erin Lynam, found that there was more oxygen present in the water of restored sites than in unrestored sites.

The overall restoration benefits, however, Hershey cautions, have been minimal.

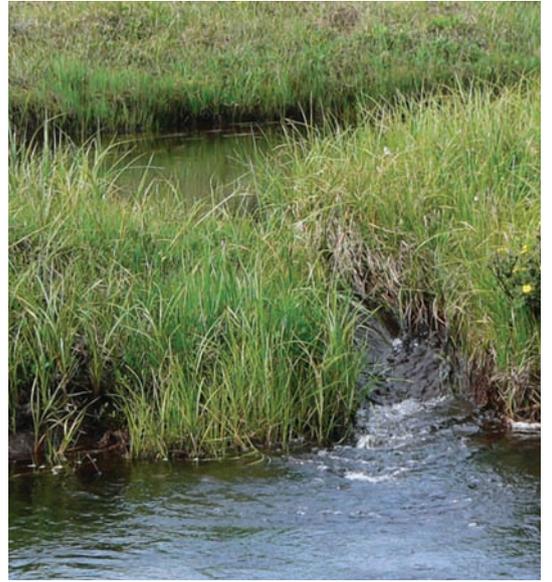
“It turns out restoration is doing some good, but it’s not doing enough,” she said.

LESSONS FROM THE ARCTIC

In Alaska, Hershey applies the same theory — the health of the earth’s water supply cannot be separated from the landscape in which it resides — to a vastly different locale.

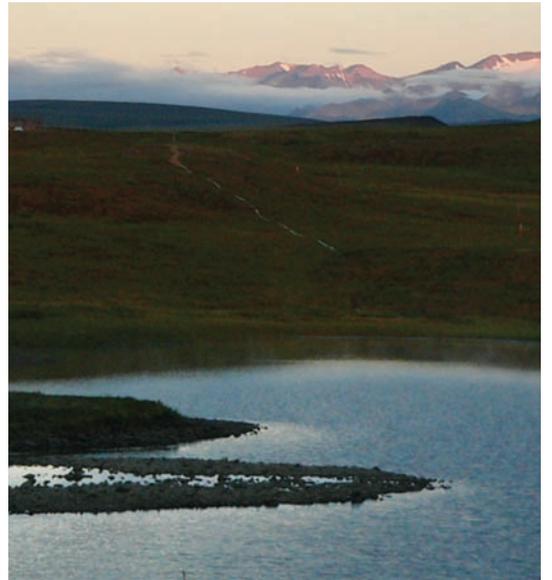
Hershey’s specialty is studying the relationship between benthic (bottom) and water column dwellers. Since coming to UNCG more than seven years ago, she has studied biotic communities in almost 200 arctic lakes. Her studies have been funded by the National Science Foundation.

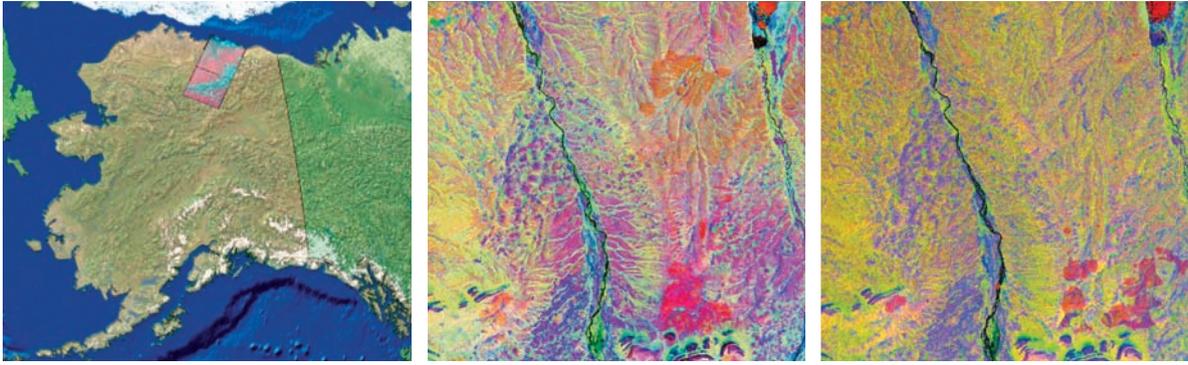
“In Alaska, you can study how lakes are supposed to work — with a minimum of human interference,” Hershey explained. In addition to being subject to contaminants, lakes/reservoirs in the Triad are too large for whole lake experiments.



Above and right are images of Alaska. With the increase in global warming the landscape in Alaska is changing at a much greater rate than the rest of the world. More greenery means more carbon in the lake food web. More carbon in the food web could increase lake productivity and alter food webs.

Below and left are images from North Buffalo Creek in Greensboro. As an urban stream, North Buffalo Creek has its set of challenges, ranging from pollutants to fast-flowing storm water runoff. With stream restoration, some viability has returned but not as much as needed.





Geography professor Dr. Roy Stine and his students have used GIS technology to map changes in vegetation in Alaska. These images are a principle component analysis of the Upper Kuparuk Basin from 1985, center, and 1999, right. The changing color tones represent changing vegetation cover. For example, Shrub Tundra is seen as light yellow-green. By 1999, Shrub Tundra is seen throughout the image.

Each summer, Hershey heads to Alaska with a team of half a dozen students who are conducting individual projects. From mid-June through August they stay in permanent tents at a research facility owned by the University of Alaska. The days, lit by 24-hours of sunlight and subject to unpredictable temperature changes, are long. Scientists often work 14 to 16 hours a day. After eating breakfast prepared by the camp cook, the scientists board a helicopter that transports them to remote research sites. After returning from the field, they are awake for several additional hours, processing samples in laboratories housed in double-wide trailers.

"These studies are helping us determine how important the landscape setting is in lake productivity. Limnologists (those who study lakes) traditionally focused on algae and ignored organic matter from terrestrial sources," she said.

"We're finding dissolved organic carbon is very important in the lake food web — much more important than previously thought."

Dissolved organic carbon (DOC) enters the lake system when vegetation and other life decompose and rain water carries the remains into the lake. The presence of DOC often is evident to the naked eye, casting a brownish stain in the water.

At the lake bottom, bacteria begin the process that will eventually feed much of the lake biotic community. Anaerobic bacteria — which survive without oxygen — convert much of the DOC to methane. The methane rises in the form of bubbles and is captured by aerobic bacteria, which process the carbon into a form that can be eaten by invertebrates, and subsequently fish.

By using stable isotopes, Hershey is able to find whether lake organisms are feeding off nutrients that are produced within the lake — by algae — or DOC entering from outside the lake. She and her colleagues add a tracer of ^{15}N — ammonium chloride, — $^{15}\text{N-NH}_4\text{Cl}$ — to four lakes in different landscape settings. This tracer is easily followed in the food web because ^{15}N can be distinguished from ^{14}N using mass spectroscopy. Most ammonium in the lake is ^{14}N -ammonium, so adding a small amount of ^{15}N creates a strong tracer. Algae readily take up ammonium (either ^{14}N or ^{15}N) as a source of nitrogen for making proteins and other important molecules. Any animals that feed on algae can also be traced by collecting them, then measuring the concentration of ^{15}N in their tissues.

If the organisms weren't feeding on algae, then they must have relied

on a food source from the surrounding terrestrial environment, part of which becomes available to them from bacteria processing DOC to methane. The methane that is produced by bacteria when consuming DOC, then consumed through the food web by other bacteria, invertebrates and fish, can also be traced using stable isotopes because methane has a very low concentration of ^{13}C compared to other forms of organic carbon.

Due to global warming, which is affecting arctic climates at a much higher rate than the rest of the world, the landscape in Alaska is changing, and the abundance of shrubs on the tundra is increasing. Dr. Roy Stine, a professor in the Department of Geography, used GIS technology to map the amount and location of vegetation in the region from 1978 to 1999. The maps showed marked increases in vegetation, which is introducing greater amounts of carbon into the lake food web. Science magazine reported in 2005 that a similar pattern is occurring in other parts of the arctic.

Further study is required to determine how far reaching the consequences of these changes will be. Hershey said possible outcomes could be: the acceleration of lake aging (which would cause the lakes to build up sediment and grow shallower and warmer), changes in the fish population (this has already begun) due to streams drying up and changing course, and the incapacity of the food web to metabolize methane quickly enough.

"Methane is a very powerful greenhouse gas that exacerbates the problem of climate change. Any methane that is produced in the lakes but not consumed is released to the atmosphere," Hershey said.

She hopes to compare histories of the lakes she has sampled, which vary in age from more than 700,000 years old to those 12,000 years old, to see how the various lakes control DOC and methane differently.

RIPPLES

Hershey's work illustrates that the small day-to-day activities of our personal lives produce ripples that can be felt hundreds, even thousands, of miles away and may cause damage that isn't easily undone. From the chemically greener lawns that result in fish kills to the emissions from one's morning commute that alter the diet of lake organisms in Alaska, life on earth is interconnected and messy.

"When we try to pick out anything by itself," author and conservationist John Muir once wrote, "we find it hitched to everything else in the universe." 

A rainbow arcs across the Alaska work camp where Anne Hershey and her students spend six weeks each summer. Each morning a helicopter lifts them to remote research sites. At the end of the day, the scientists spend several hours processing samples in laboratories housed in trailers.

Below, Hershey, left, and graduate student Matt Keyse demonstrate the use of a multi-probe, which measures several aspects of water quality in North Buffalo Creek.





Christian practice insists on a Trinity of Father, Son, and Holy Spirit. Yet Christian theology has had trouble explaining what the Holy Spirit adds. Anything the Spirit could do, Christ could do better.” Dr. Eugene Rogers

As an expert in modern religious thought, Eugene Rogers, professor of religious studies, was dismayed to find academic theologians consigning the Holy Spirit to irrelevance.

In his newest book, Rogers upends conventional wisdom on the topic. “After the Spirit: A Constructive Pneumatology from Resources outside the Modern West,” published last year, challenges readers to reassess their views of the Spirit.

“To think about the Spirit it will not do to think ‘spiritually:’ to think about the Spirit you have to think materially,” said Rogers. In modern theology, he contends, the Spirit has become a disembodied entity of sorts without a tangible home — and conversations about it have consequently lacked depth and urgency.

In Eastern Christian traditions, however, the Holy Spirit is more

firmly grounded in religious culture through links to holy sites, holy people and holy things. Drawing on this tradition, Rogers explores the role of the Spirit in a variety of Gospel stories, ranging from the annunciation to Jesus’ resurrection. In doing so, he reminds readers of the Spirit’s important ties to the tangible world as well as its unique place in the Trinity.

Jeffrey Stout, professor of religion at Princeton University, has called “After the Spirit” “a learned, eloquent, gracious response to the dearth of theological reflection on the Holy Spirit in the modern Christian West.”

Rogers, who earned his doctorate at Yale, joined UNCG’s faculty last year after 12 years at the University of Virginia. He is the author or editor of four books and more than 20 articles and translations.



Dance meets anthropology

WHEN ROBIN GEE, assistant professor in the Department of Dance, talks about her research on the Mande in western Africa, she sounds almost as much an anthropologist as a dancer.

“I’m a traditional artist, and traditional art is really very tied to social practice, so I chose to pursue a research agenda that encompasses both scholarship and performance,” Gee said.

The Mande is a diverse ethnic group that is nonetheless tied by common language, history, tradition — and dance.

“There is one dance that binds them all, the Doundounbah. It’s essentially a male-centered dance, a dance of strength and precision, and I’m looking at the way women are integrated into that dance,” Gee said. “It’s a dance that’s a prelude to hunting, a prelude to war. Since women weren’t traditionally part of that context, they played a secondary role. Now, the context has changed, so a woman’s role in the dance has changed.”

As the Mande and other groups in Africa have gone from a traditional, more rural environment to a more urbanized one, Gee is interested in how they — and their dance — have changed as a result, especially how women’s normally secondary role has become more and more essential or primary in the dance.

As part of her research, Gee participates in dances in rural and urban settings, what she calls “embodying the research” or learning the dances herself, and then teaches them in her classes. So far, she has traveled to Guinea twice on such research trips. She plans to travel to Africa at least two more times. Eventually, she hopes to choreograph her own pieces based on her research.

Department of English Professor Michael Parker is the author of five books, the most recent of which is the acclaimed "If You Want Me to Stay." One critic ranked it among the greatest rock novels ever. Rhythm and blues, rock and roll play like a sultry soundtrack behind the plot of a boy trying to find his mother after his father goes mad again. Other critics have hailed Parker's use of language in rendering an accurate depiction of the eastern North Carolina accent of a teenage boy. The following excerpt begins the book.

That morning my daddy went off for the worst time, I was listening to some Rufus Thomas.

"Push and Pull," I believe it was, or maybe it was "Walking the Dog"? Both of them feature a saxophone sounds like it's sliding upside you in bed on a bone cold night, and look — there are just certain songs which, look, if you hear them and your ass does not in any way respond, I am talking not the slightest slow-twitch muscle memory if you're old and the minimal sway if you're still young enough to shake it, well, look — it's hopeless. Give it up. What is even the point?

I had Rufus turned up loud while I fixed breakfast for my little brothers. Froot Loops and canned peaches which Carter likes them drained and Tank cares nothing for the peaches themselves, he's all over the syrup. Ten in the morning and Carter and Tank were playing up under their bed with soup spoons to catapult plastic army sergeants up into the box springs. I had called them and I had called them.

I stood in the kitchen, moving to Rufus. It occurred to me to wonder where my daddy was but when he's All Clear he likes to get up early and mess around outside. He's got a vegetable garden going every season he's well enough to get something in the ground good after the last hard frost. Me and Tank and Carter, we used to help him out hoeing and especially watering which we liked because Tank would plant his sergeants in the furrows and we'd flood their asses head over heel down out of

there when the levee broke high up in the pretend mountains (there being nothing higher than an anthill within fifty miles of our corner of southeastern North Carolina) flooding also in addition to the sergeants, Tank's namesake tanks, my long-gone older sister's troll dolls, Cracker Jacks we would be eating to keep up our strength while hoeing and watering and whatever else pack-rat Carter would stick out there to get obliterated by the awesome force of nature. But sooner than later it turned itchy and hot out in that garden and my daddy would tell us it's okay boys y'all are now officially off the clock and we'd get on our bikes and take off. Bye now, Daddy, you better put on some sunscreen! He'd holler back at us to be sure and hydrate. We might see him again in an hour or sometimes not until supertime, it did not matter when he was All Clear.

The Froot Loops were puffing up, pink-milk-soaked for nearly an hour while I did not bother looking out for my daddy and called to my brothers who did not come and did not come. Could have been they hollered something smart-assed back at me. Likely I had turned up Rufus even louder, was walk walk walking that dog or doing that dance they call the Push and Pull. All I know is somehow I felt it, through the sweet saxophone and a rhythm section so slaphappy it slung water out of the muddy Mississippi all over them boys' breakfasts when I went to pour some milk in their glasses: the end of the All Clear in my poor daddy's head.

The study of writing

PUBLISHING THAT FIRST BOOK. So many would-be, daydream writers think about it. The readings. The movie deals. The billions in royalties.

"Many young writers think if they publish their first book, that it will change their lives," said Craig Nova, professor in the department of English. "It doesn't. Or, if it does, it changes your life for the worse."

Take it as a note of experience. At the fresh age of 26, after publishing his first book, the award-winning "Turkey Hash," Nova went back to work. He worked as a cabbie in New York. He worked in construction. He drove a truck and managed real estate.

"If I got a little extra money in the bank, whatever I was doing, I'd drop it, and take up writing full time until it ran out," Nova said. "I didn't really start making a living at it until my fourth book."

Now, after 12 books and 25 years making a living at novels, Nova, the Class of 1949 Distinguished Professor in the Humanities at UNCG, has the hard work part of writing down pat. During his hard-scrabble days, his schedule went something like this: work for 12 hours; eat and get a nap; write for a few hours; go to bed. Repeat.

He's also got the research stuff down, too. Nova believes experience is the way to inform writing.

When he was writing a book having to do with doctors, he spent time in

an emergency room. When he was writing about a female cop who worked the vice squad, he spent eye-opening time with the New York City vice squad.

"I like to be around people when they are doing things. Not talking, understand, but doing things," Nova said.

So, when he heard about a shooting that involved state troopers, he began his research by riding around with a highway patrolman.

"In order to be able to write about this thing, I was out there riding with him at 110 miles an hour. You know, incredibly exciting. But ... I had to admit I was just having fun or spending time with someone whose life was more exciting than mine on an hour-to-hour basis. And that's no way to write a book. You write a book the old fashioned way — one word at a time."

All those words ended up being "Cruisers," his 2004 book about a disturbed man crossing paths with a state trooper.

Now he is finishing up another book, a novel about a female police officer in 1930s Berlin.

For research, he read histories of police departments in the Weimar Republic and visited Berlin and the Berlin Police Museum. He also sees, in the political tensions in that place and that time, parallels to our own country and our own time.

"Besides," Nova admitted, "I just wanted to tell a great story."

The Last Generation: Young Virginians in Peace, War and Reunion

By Peter S. Carmichael
University of North Carolina Press

TYPICALLY BRANDED as hot-tempered and politically disengaged, young men of the Civil War era were in truth very interested in the fate of their state and country, historian Peter S. Carmichael argues in his latest book, "The Last Generation: Young Virginians in Peace, War and Reunion."

"These men certainly engaged in mischief, such as drinking, gambling and hunting, but they also had vibrant intellectual lives," he said.

Carmichael takes a critical look at the writings of young 19th century Virginians and provides fresh insight into how members of this generation formed their identities as Southerners and defined the roles they played in the Civil War and the Reconstruction. The history professor examined 75 master's theses from the 1850s, as well as articles in literary magazines and transcripts from debating societies of the time. The resulting 343-page book was published by the University of North Carolina Press in May as part of the acclaimed Civil War America Series.

"There was more diverse opinion over the question of disunion in the upper South than was generally believed," the professor said. "The youth preceded their elders in calling for secession. The elders saw political action, such as burning the flag in effigy, as 'childish,' and as 'boys being boys.' This book takes young people seriously, on their own terms."

Young men believed secession would improve their professional futures in the South, and at the same time, protect their region from the supposed abolitionist designs of the North. Moreover, their pleas revealed a vision of slavery coexisting with a modern economy that included light

industry, railroads and urbanization. Carmichael's book challenges those historians who see Southerners as defenders of an insulated, agrarian way of life.

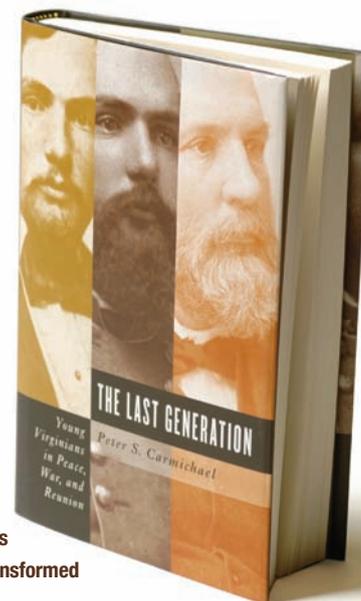
Yet, the political positions of the Last Generation shifted throughout their lifetimes.

"We can see how people's loyalties and identities are transformed by war," Carmichael said.

The destruction of the war eventually turned these men into zealots who refused to admit the possibility of defeat. After the war, they preached reunion and reconciliation; yet, at the turn of the century, the mythmaking began, Carmichael said.

"They romanticized their experience to make sure certain political voices would be forgotten. The war became a war between brothers, not a war over slavery," he explained.

Carmichael gave talks about his new book across the eastern United States last year, including stops at the Civil War Institute in Gettysburg and at Jefferson Davis' home.



Ensembles share musical vision



THE TOP ENSEMBLES at the School of Music have captured their creative energies on compact disc. The UNCG Jazz and Wind ensembles released "vision" and "ra!," respectively, in 2005.

The Jazz Ensemble recording features nine tracks, seven of which are original compositions by students in the Miles Davis Jazz Studies Program. Director Steve Haines also lent his writing talents to an arrangement and to a composition honoring his native Canada.

"vision" is the seventh CD released by the Jazz Ensemble. Last year's "Live with Dewey Redman" drew the attention of Jazz Education Journal reviewer Herb Wong, who gave the recording a Blue Chip Award, citing the students' strong composing talents.

"ra!" is the 13th recording released by the UNCG Wind Ensemble. The CD features "The Courtly Dances from Act 2 of the Opera Gloriana, Opus 53" by Benjamin Britten, arranged by Jan Bach; "Symphony No. 2" by Frank Ticheli; "Niagara Falls" by Michael Daugherty; "Ra!" by David Dzubay; "Sinfonietta" by Ingolf Dahl and "Radio Waves" by Frederick Alton Jewell. Director Dr. John Locke led the ensemble; Doug Presley guest conducted "Niagara Falls."

Wind Ensemble CDs cost \$10. Purchasing information is available at www.smcamp.org/windensembleCDs.htm. Jazz Ensemble CDs cost \$15 and are available at <http://jazz.uncg.edu>.

NEW MOTHERS FACE MANY CHALLENGES — learning to feed their babies, dealing with lack of sleep, sorting through advice from friends and family. But responding sensitively to their crying infants may be one of the most daunting tasks.

Crying means a baby needs something, but it can be difficult to determine exactly what. At the same time, society often judges mothers on their ability to manage their infants' distress.

Dr. Esther Leerkes is hoping to uncover more about the process mothers use to respond to infant distress — in an effort to learn more about parenting and its effects on early childhood development.

"A lot of people look at broad personality traits or risk factors in relation to the quality of parenting," says Leerkes, an assistant professor of Human Development and Family Studies. "I was more interested in what mothers are thinking and feeling about their infants' distress — in the moment — and how that relates to how the mothers are behaving."

Leerkes found that mothers who respond sensitively to infants — which means quickly, frequently and in a way well matched to the infants' needs — have several abilities, including being able to identify their infants' emotional state.

"Is the baby sad or angry or happy? You would think if the mom was more accurate, she'd be more sensitive," Leerkes says. "But that's not enough. You need to be accurate, and you still need other things."

These abilities include:

- Feeling empathetic, rather than annoyed or anxious, in response to crying.

- Finding positive and realistic causes for an infant's crying.
- Responding based on the infant's emotions, not your own.
- Being confident.

"What seems to predict these feelings and thoughts?" Leerkes asks. "I don't think it's surprising that the way we were parented in childhood is very much related. But other things matter too, including the mother's personality and the quality of her current partner/marital relationship."

After beginning her research at the University of Vermont, Leerkes is continuing her project now with a more diverse parent sample. She is studying about 100 families and hopes to expand to 300. The mothers are interviewed while pregnant and return when their infants are 6 months old, toddlers and, hopefully, preschool age.

With the aid of funding from the National Institute of Child Health and Human Development, Leerkes and her researchers observe the mothers and infants. They often create situations that are mildly frightening or frustrating for the infants and then observe the mothers' response.

While much research has been done in free play or problem-solving settings, Leerkes says few studies have delved into highly emotional times — when children are distressed.

"Yet I think this should be most related to how they do later in life," Leerkes says. "I'm interested in seeing if how mothers respond to infants' emotions is related to how these infants develop, socially and emotionally, during early childhood."

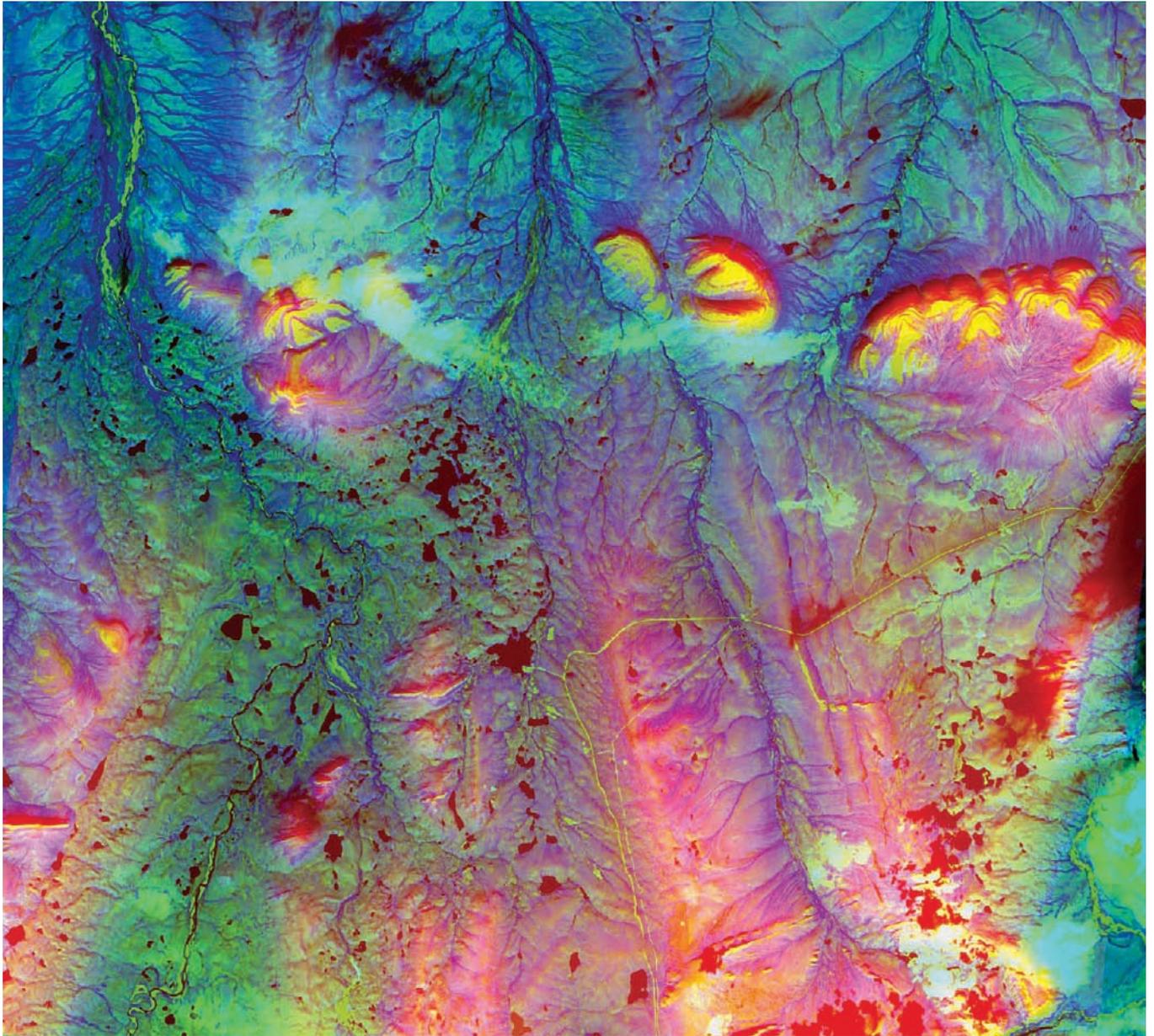


Is the baby sad or angry or happy? You would think if the mom was more accurate, she'd be more sensitive. But that's not enough. You need to be accurate, and you still need other things."

Dr. Esther Leerkes



THIS AUGUST 2005 SPOT IMAGE portrays the research area around Alaska's Lake Toolik merged with a Digital Elevation Model (DEM) of the same area with same spatial resolution of 5m. The image shows the band 4 (elevation) in red, band 2 in green and band 1 in blue. Images such as these have been used to map changes in vegetation in Alaska which coincides with biologist Dr. Anne Hershey's research on the health of lakes in Alaska. To read more about her research, see page 24.



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