



BioUpdate

Department of Biology, Middle Tennessee State University

Spring, 2013



Lynn Boyd

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Message from the Chair

Hello to all the friends of the Biology Department at MTSU!

It is an exciting and interesting time around here. First let me introduce myself. My name is Lynn Boyd. I began as Chair of the Department on July 9, 2012. I came to MTSU from University of Alabama in Huntsville where I was on the faculty for 14 years. I am very excited to become a part of the Biology family at MTSU. I really appreciate the warm welcome that I have received from all over campus and especially from folks in the department. If you are interested in learning a little bit more about me and my research program, please see the article in this issue of *BioUpdate*.

I want to extend a very special thanks to the staff in our department. I cannot imagine a more competent and pleasant set of people to run this department. The responsibilities held by our staff are many. Karen and David keep our labs operating. Our office staff makes sure that students and faculty have the administrative support they need. There have been a few changes in the office. Dr. Dennis Mullen is the department's Associate Chair. Debbie Rowland, the executive aide for the department for 14 years, has retired. Lyn Powers has been promoted into that position. Ellen Jones has replaced Lyn as the technical clerk. Ellen apparently loves pouring over departmental budgets and has so far kept us from financial ruin. Congratulations to Becky Elrod who was recently promoted to executive aide. She will be handling matters associated with our graduate program. Our amazing departmental secretary Virginia McKnight continues to handle the front office with a grace and efficiency that is remarkable. I know she is looking forward to a well-deserved summer break. I cannot say enough good things about the staff in this department.

Faculty and students in the department have had quite a productive year. Last year, 36 peer-reviewed publications came from the department. Faculty were also engaged in writing grants, serving on national committees, and attendance at national/international meetings. Siti Hidayati, adjunct professor, received a Fulbright Scholarship and plans to conduct studies in Indonesia in 2014. For more details about faculty and student activities this past year, I invite you to peruse the pages of *BioUpdate*.

During the winter break this year, faculty participated in a two day retreat during which we discussed opportunities and objectives for the department. Through this process we are developing a set of Student Learning Outcomes for our programs.

(continued...)



from the Chair...

We are also formulating a set of focus areas for the research efforts in the department. Both of these things will be posted on the departmental website in the future.

We welcome new faculty into our department this year. Dr. Mohamed Salem (see article on New Faculty in this issue of *BioUpdate*) came to MTSU in August 2012. In August 2013, we are anticipating the arrival of two other new faculty: Dr. Jason Jessen and Dr. David Nelson. Both individuals will be highlighted in next spring's issue of *BioUpdate*.

As we are greeting our new Biology colleagues, we are saying goodbye to the some retirees. Debbie Rowland, Kurt Blum, and Wayne Rosing are retiring this year after many years of incredible service to our department. They will be truly missed.

The biggest excitement in the department comes with watching our new building grow. We are in desperate need of more space for our classrooms and research and the new building is a welcome solution. The building is scheduled to be finished in Summer 2014 and the installation of technology and furniture will occur during Fall semester of 2014. The departmental office and some research labs will move into the new building during that Fall semester. We will begin classes in the new building in Spring 2015. Many, many thanks to our current building shepherds, Amy Jetton and Dennis Mullen, for steering us through this very complicated move process.

I encourage you to look through the pages of *BioUpdate* and learn about the many interesting things going on with our faculty, students, and alumni.

Lynn Boyd

New Faculty



Mohamed (Moh) Salem was born and grew up in Cairo, Egypt. He received his Bachelor's and Master's Degrees from Zagazig University in Egypt. In 2004, Moh received his Ph.D. from West Virginia University. The title of his dissertation was "Cloning and Molecular Characterization of Calpain/Calpastatin Genes from Rainbow Trout. A Potential Biogenetic Tool for Monitoring Muscle Growth and Texture Development." He continued at WVU with two years of post-doctoral research and then for five years as a research Assistant Professor. Last fall he was hired here at MTSU.

In his research, Moh develops and uses the state-of-the-art genomics technologies to characterize various physiological processes in non-model species. He uses high throughput genomics and bioinformatics approaches to study gene pathways that regulate different physiological traits. The main goal of his research is to tackle problems afflicting the aquaculture and seafood industries in the US. In many of his projects, he utilizes genome-wide approaches to examine and enhance fish production traits with particular interest in muscle growth and quality. For over twelve years, he has been a driving force of the Rainbow Trout Genome Project; funded by the USDA. His efforts have yielded many fish genomic research tools including gene-chips, transcriptome references, genetic markers, SNPs and microRNAs databases. Moh's research has involved the collaboration with international and US universities, private companies and federal laboratories. He has published about 25 papers in various journals including *BMC genomics*, *Physiological genomics*, *PLoS* and the *Journal of Proteomics*.

Last fall semester, Moh taught in the Genetics course (BIOL 3250), both lecture and lab. He is doing the same this spring semester. Eventually, he will be involved in the Genomics and Molecular Biology courses. His office is 337 Jones Hall.

Moh lives in Murfreesboro with his wife, Nashwa and children, Samar age 17, Basant age 15, and Abd age 9. Their interests include sports, walking, exercise, running and traveling.

Let us hear from you...

BioUpdate wants to feature the accomplishments of alumni, and we encourage you to update us often!

Send us your name, MTSU degree/year, along with an update of your professional/career activities, awards, accomplishments. You may also include any personal news of interest that you would like to share with our readers.

Please include an email address so we can contact you if we need additional information.

Send contact information and updates to: Biology Department, MTSU Box 60. Murfreesboro, TN 37132,

Fax: 615-898-5093, E-mail: John.Dubois@mtsu.edu.

Departmental Logo Shirts and More

The department is selling shirts, backpacks, insulated lunch bags, coffee mugs, and water bottles that sport the departmental logo. The drawstring backpacks and insulated lunch bags are new this year. The shirts come in five styles: a light tan short-sleeve or long-sleeve T-shirt with the logo on the upper right front and an enlarged color logo on the back; a dark green short-sleeve or long-sleeve polo shirt with the logo on the upper right front; and, a long-sleeve denim shirt with the logo on the upper right front. Several faculty and students have been seen wearing the shirts. The coffee mugs are white with the logo in blue on both sides (logo will be visible regardless if you are right- or left-handed). The stadium cups are 16 oz. blue plastic with a white MTSU Biology logo. The key lanyards are blue ribbed polyester cord with a white MTSU Biology logo. Prices are as follows:

T-shirts:	Short-Sleeve:	\$10.00	Heather gray pull-over hoodie:	\$25.00
	Long-Sleeve:	\$12.00	(Printed like t-shirts)	
Polo shirts:	Short-Sleeve:	\$20.00	Insulated lunch bag	\$ 8.00
	Long-Sleeve:	\$25.00	Drawstring backpack	\$ 5.00
Denim shirts:	Long-Sleeve:	\$28.00	Coffee Mugs:	\$ 3.00
			Stadium Cups:	\$ 1.00
			Key Lanyards:	\$ 2.00

All items can be purchased in the departmental office. For more information or to purchase an item (or two), contact Virginia McKnight (615-898-2291 or by email: Virginia.Mcknight@mtsu.edu).



Featured Faculty Member: Lynn Boyd

Last July, the Department of Biology received a new Chair, Dr. Lynn Boyd. She was selected as this year's Featured Faculty Member. Although Lynn was born in Anderson, South Carolina, she attended and graduated from John Overton High School in Nashville, TN. She became interested in biology at an early age and finds just about everything in biology to be interesting. In 1983, she received her Bachelor of Arts degree in Latin from Wake Forest University in Winston-Salem, NC. In 1992, Lynn received her Ph.D. in Human Genetics from the University of Utah in Salt Lake City. The title of her dissertation was "Translational Control of E74A protein in *Drosophila melanogaster*." She continued research as a Post-Doctoral Fellow in the lab of Dr. Ken Kemphues at Cornell University from 1992 until 1996. She spent the following year as a Visiting Assistant Professor in the Biology Department of Colgate University in Hamilton, NY. Prior to her appointment here at MTSU, Lynn spent 14 years as Assistant/Associate Professor in the Department of Biological Sciences at the University of Alabama in Huntsville. During that time, she was awarded a sabbatical appointment (July, 2008-June, 2009) in the lab of Dr. Andy Golden at the National Institutes of Health NIDDK (National Institute of Diabetes and Digestive and Kidney Diseases) in Bethesda, MD.

Dr. Boyd's research interests lie in the fields of developmental biology, cell polarity, the ubiquitin pathway, and fertilization. She has published her research in a variety of journals including *Development*, *PNAS*, *Journal of Cell Science*, *Genesis*, *Science*, and *BMC Cell Biology*. Currently, she is mentoring four graduate students: Paola Molina, Katherine Sampuda, Jacob Sanders, and Lynn Harmon. There are no undergraduate research students in her lab, but interested students are welcome.

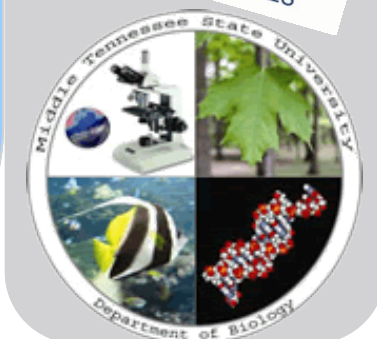
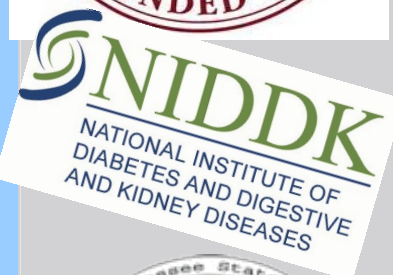
During her career, Lynn has participated in the HERS Summer Leadership Institute and served as Parliamentarian and President of the UA-Huntsville Faculty Senate. Since 2004, she has been a Steering Committee Member of the Partnership for Biotechnology Research. While at UA-Huntsville, she received the Martin Luther King, Jr. Award from the Minority Graduate Student Association and the Outstanding Faculty Member Award from the UAH Student Government Association.

In her previous positions, Lynn taught courses in Genetics, Cell and Developmental Biology, Molecular Biology of the Cell, Laser Scanning Confocal Microscopy, and Fertilization and Early Embryogenesis. This spring semester, she is teaching one section of the Senior Seminar (BIOL 4200) and is scheduled to teach Genetics (BIOL 3250) this summer.

Lynn says that in her "former life" she enjoyed Frisbee golf, canoeing and kayaking. She participated in sea kayaking trips in Baja, California and the Bahamas, and canoe trips to Canada and elsewhere. During and after college, she worked as a raft guide on several rivers in Georgia and California. When she lived in California, she made a couple of "first descent" raft trips on rivers in the northern parts of the state. While in Colorado and Utah, she did a lot of backcountry skiing. Lately, Lynn reports that most of her free time is taken up as a soccer mom, hockey mom and dance mom to her children, Sofia, age 16 and Yuli, age 14. She and her children are happy to be living in middle Tennessee and she is delighted to be a part of MTSU.



**MIDDLE
TENNESSEE**
STATE UNIVERSITY





by Cindi Smith-Walters

The past year has been one of great change and accomplishment for the MTSU Center for Environmental Education. The Center, an outreach arm of the MTSU Department of Biology, celebrated 35 years of quality service to teachers, students, and the general public of not only the Middle Tennessee region, but statewide as well!

Since 2005 external funding to the CEE has exceeded \$2,301,778 and materials developed include, but are not limited to: print and visual public service announcements, environmental curricula, teacher and youth leader workshops and seminars, brochures, web resources, publications, and more. (see photo of selected of resources below). The CEE continues its strong tradition of loaning biology education materials to teachers and youth leaders. These include the 'Scopes for Schools' program headed by Dr. Kim Sadler and the Biodiversity, Bat, Trees, Composting, and Solid Waste trunks available through Dr. Cindi Smith-Walters.

Currently the CEE houses the Center for Cedar Glades Study (see article in this edition of Bio Update) and the Tennessee Amphibian Monitoring Program (TAMP). TAMP is funded through the Tennessee Wildlife Resources Agency, and directed by CEE part-time staffer, Bob English. TAMP volunteer 'frog loggers' go through a rigorous training where they learn about frogs and toads of Tennessee. In addition they learn to identify frog and toad calls. The volunteers are then assigned one or more routes



photo credit: Bob English, LEAPS

which they run four times a year. Data collected are put into the North American Amphibian Monitoring Program database and a GIS based TAMP database.

All trained volunteers and educators, upon request, are provided with the TAMP CD 'Vocalizations of Tennessee Frogs and Toads' after training. This CD was revised this past year to reflect the most recent nomenclature for scientific names of species. A new master disc was created and jacket notes brought up to date. Funding for the pressing of 1000 of these new CDs was provided through a generous MTSU Public Service Grant. We were fortunate to be able to add a number of records to the database and suspect a number of range extension for species. This next year TAMP will try to confirm these.

The CEE has housed the award winning (and nationally recognized) *WaterWorks!* program for the past 6 years. The Environmental Protection Agency requested the use of 19 television and six radio public service announcements as well as two *WaterWorks!* survey templates for inclusion in the EPA Toolbox. The Toolbox features outstanding public service documents and public service announcements for use by water quality programs in other states.

Water quality continued as the buzz word at the Center during the 2011-2012 school-year. In the summer of 2011 a great deal of work was done as part of the cooperative agreement between the CEE and the City to provide education and outreach in the area of water quality both on and off campus. This topic included tree planting, clean-ups, camps, summer field trips for students of all ages, and more. Water quality surveys which included items on water knowledge and use was distributed to targeted geographic areas within the City of Murfreesboro and these results were shared. Because the cooperative efforts with the City of Murfreesboro were so successful, the full time staff of the CEE, Cynthia Allen, Outreach Coordinator and

Amanda Sherlin, Grants Coordinator were moved to MTSU Facilities Services and that arm of the University contracted directly with the City to provide water quality outreach and education.

Additional highlights of this past year include the work done with the Tennessee Department of Environment and Conservation on *Tennessee 2020: Vision for Parks, People, and Landscapes*. This documents the most critical needs facing our State's conservation and recreational infrastructure over the next 10 years, to enable us to maintain the recreational assets, prioritize specific needs for

CEE cont.

the future and take action to meet those needs. This document was approved in 2011. Further documents in which Dr. Smith-Walters has provided input include the Tennessee Environmental Literacy Plan for students K-12. The plan includes recommendations for a new high school graduation requirement, correlations for existing science and social studies standards with environmental education standards provided by the North American Association of Environmental Education (NAAEE), and guidelines for professional development. Nancy Dorman, TDEC employee and committee chair says, "An environmental literacy plan is an important step to ensure that Tennessee students graduate with an understanding of the complex ecological, social, economic and cultural processes that influence the health of their state and the world at large. An environmentally literate student should have the knowledge and skills needed to make informed decisions and to become environmental stewards."

The CEE is also a member of Every Child Outdoors – Tennessee (ECO-TN), a coalition of more than 100 supporting organizations that include local, state and national organizations



and agencies, governments, non-profits and businesses representing health, natural resource, education, hunting and fishing, recreation and youth stakeholders. With recent concerns about youth detachment from the outdoors, lack of physical exercise and increased health risks, ECO-TN has adopted The Tennessee Children's

Tennessee Environmental Literacy Plan

Explore, Learn, Engage



Accepted by
Tennessee Department of Environment and Conservation
and
Tennessee Department of Education
July 23, 2012

"A person is environmentally literate when they have the knowledge of environmental processes and issues needed to make informed decisions and participate in civic affairs."

-National EE and Training Foundation and EE Council

Outdoor Bill of Rights (TCOBOR). TCOBOR is a list of experiences from which every child in Tennessee would benefit. Studies document that children who engage in these activities are healthier, perform better in school, have better social skills and self-image, and lead more fulfilled lives. The Tennessee Children's Outdoor Bill of Rights states that every child, before entering high school, should have the opportunity to: Walk in the woods; Play outside; Explore nature; Watch wildlife; Grow a garden; Splash in the water; Camp under the stars; Learn to swim; Climb a tree; Go fishing; Fly a kite; Visit a farm. The CEE was a co-sponsor of this event in the fall of 2012. If you are interested in ECO-TN or the Tennessee Outdoor Classroom Symposium held each fall, contact Dr. Smith-Walters at the MTSU CEE.

Dr. Smith-Walters sits on the steering committee of a fairly new non-profit organization, The Tennessee Naturalist Program. TNP is an education training course designed to introduce the natural history of Tennessee to interested adults. Graduates join a critical corps of Tennessee Naturalist volunteers providing education, outreach, and service dedicated to the

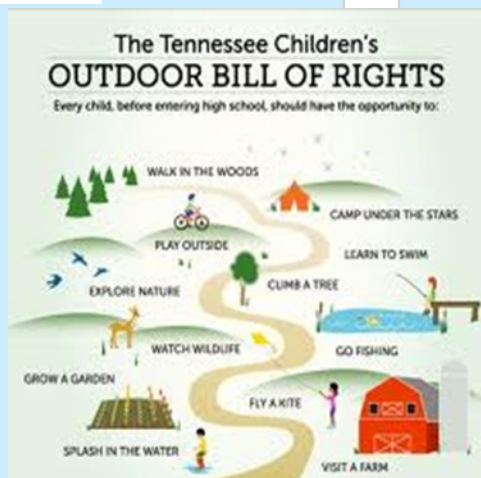
appreciation, understanding, and beneficial management of



natural resources and natural areas within their communities. In order to maintain certification, graduates must provide 40 hours of volunteer time each year.

The mission of the Tennessee Naturalist Program is "Inspiring the desire to learn and share Tennessee's nature." In brief, TNP teaches adult Tennesseans about our natural world, inspires the desire to learn more, instills an appreciation of responsible environmental stewardship, and channels volunteer efforts toward education of the general public and conservation of Tennessee's natural resources. Courses are held statewide by TNP Chapters. You can get more information at <http://tnnaturalist.org/> or by contacting the CEE.

With the loss of our full time staffers the work of the CEE has changed somewhat. We are



News from Forensics Science Program

by George Murphy, Professor Emeritus, Biology Department

The MTSU B.S. in Forensic Science is unique as a truly interdisciplinary program, sharing faculty, courses, and resources from the departments of Biology, Chemistry and Criminal Justice Administration. Development of new programs requires considerable information gathering and planning. In 2006 as part of the proposal development, the three departmental chairs began discussions of a potential degree with lab directors of the Tennessee Bureau of Investigation (TBI) and visited the Nashville lab, reviewed accreditation requirements and suggested curriculum of the American Academy of Forensic Science (AAFS), consulted other forensics programs, and reviewed the U.S. Bureau of Labor Statistics Job Projections. After the proposal received campus approval, it went to the TBR and THEC in 2008. Final approvals were gained in 2010 and the first majors were admitted in fall, 2010. By fall 2011 we had 83 majors, and in fall 2012 there were 105 majors (21 seniors, 13 juniors, 20 sophomores, and 51 freshmen). We had our first graduate in December, 2011, who now works for the TBI, and two additional graduates in August, 2012.

Program goals are to provide a solid foundation in developing lab scientists who can work in public crime or private laboratories, and to prepare graduates for additional study in forensics, related disciplines, or professional schools. We think that the forensics degree has great potential to become an important part of the MTSU degree offerings and attract quality students to our campus and departments.

We have been fortunate in receiving tremendous support from many groups. We have had individuals from law enforcement agencies (Rutherford County Sheriff's Department, Murfreesboro Police Department, and Metro Nashville Police Departments), judicial (prosecuting and defense attorneys and a sitting judge), and forensic lab personnel (current and retired TBI, Metro Nashville



CEE cont.

working more closely with teachers, classrooms, and youth groups. Dr. Padgett Kelly continues to spearhead the 'Whale of a Tail' outreach and presented to over 5,500 students in the past year. He also works closely with both the National Marine Educators and Tennessee Educators of Aquatic and Marine Science (TEAMS). Both Drs. Kelly and Smith-Walters present at State, Regional, and National meetings while averaging 3-5 consults per week with classroom teachers, youth leaders, and school faculty on environmental and science education, outdoor classrooms, implementation of the Tennessee Environmental Literacy Plan, and more.



Materials developed through partnerships of the MTSU CEE and various local, state and federal sources. (photo credit: Padgett Kelly)

Crime Lab, and Miami Crime Lab) as speakers for our upper division seminars. Special thanks are due the TBI for accepting our students for their required internships.

Since my retirement from the Biology Department on 30 June, 2012, I have assumed a half-time post retirement position as Director of the Forensics degree program. My immediate duties include advising all forensic majors, assisting in establishing internships, and initial data collection and organization necessary to apply for accreditation by the AAFS programs accreditation commission. Please encourage anyone interested in the Forensics program to contact me at:

George.Murphy@mtsu.edu, phone: 615-494-8740 and my current office location is Fairview Building, room 103.

Theses Completed (2011-2012)

The Biology Department graduated 12 students with the Master of Science degree in Biology during the December 2011 and May, August and December 2012 ceremonies. As of the December, 2012 ceremony, the Biology Department has produced 335 master's theses. Nationwide, Middle Tennessee State University is a leader in producing master's level graduates. Students, their graduation year, thesis titles, and faculty advisors are recognized below. A complete list of all theses completed to-date in the Biology Department can be found at <http://capone.mtsu.edu/jddubois/3230/theses.html> or on the Biology Community section of D2L.

Adams, David. 2011. Forest composition based on different limestone substates in the inner Central Basin of Middle Tennessee. (Steve Howard, Advisor)

Adetona, Efua. 2012. *Matricaria recutita* L.: antimicrobial and allelopathic properties. (Mary Farone, Advisor)

Bowman, Chris. 2011. The effects of various silver nanoparticle sizes on Zebrafish (*Danis rerio*) development. (Ryan Otter, Advisor)

Campbell, Jacob. 2012. The effects of body mass, temperature and hypoxid/hypercapnia on the metabolic rate of terrestrial and fossorial snakes. (Vince Cobb, Advisor)

Cusaac, Joseph. 2012. Effects of maternally-transferred methylmercury on plasma corticosterone and liver peroxidation in Northern Water Snake (*Nerodia sipedon*) neonates. (Frank Bailey, Advisor)

Davis, Rebecca. 2.12. Effects of high temperature ($\geq 35^{\circ}\text{C}$) on mean photosynthesis and stomatal conductance rates in endophyte infected (EI) and endophyte free (EF) tall fescue. (John DuBois, Advisor)

Flanigan, Noah. 2012. Winter warm spell effects on seed germination among native and exotic plants in a riparian community. (Jeff Walck, Advisor)

Hamilton, Jennie. 2012. Potential role of avians in the distribution of *Rickettsia* species. (Stephen Wright, Advisor)

Molina, Paola. 2012. Role of mitochondria and liposomes in ultraviolet light induced apoptosis in Neuro-2a cells. (Jerry Reagan, Advisor)

Nizamaddin, Shara. 2012. Investigating the role of oxidative stress on Ag and ZnO nanoparticle toxicity in developing Zebrafish (*Danis rerio*). (Matt Elrod-Erickson, Advisor)

Pitt, Margaret. 2011. Quantitative analysis of plastid intercistronic transcript linkage. (Bruce Cahoon, Advisor)

Plant, Billy C. 2012. Relationships among soil properties, species richness and plant coverage in cedar glades of Middle Tennessee. (Jeff Walck, Advisor)



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Like us on Facebook and follow us on Twitter. On Facebook, search **MTSUBiology**. When on Twitter, search **@mtsu_bio**. Keep up with the Department of Biology on social media. While there, tell us what you have been doing.



The New Science Building: It's Really Going to Happen!

The existing Davis Science building and Wiser-Patton buildings (built in 1967 and 1932, respectively), currently house most MTSU science programs in a combined 75,332 net square feet. In 1968, just after the Davis building opened, MTSU's student head count was at 6,779. By fall 2011, the University's enrollment was 26,442. That means MTSU has seen its student population increase almost fourfold with no increase in space for science education over the past half century.

By contrast, the new Science Building will provide more than 250,000 gross square feet of teaching, faculty and student research laboratories, and collaborative learning spaces, a far more adequate situation for the more than 13,000 students, both majors and non-majors, who are enrolled annually in biology, chemistry, and physical science courses at MTSU.

The research space in the new building will be expansive. Two areas will have a particularly powerful impact. On the biology side, MTSU will, for the first time in its existence, have an animal facility for conducting research. On the chemistry side, modern ventilation will allow experiments long prohibited in MTSU's old buildings to finally proceed.

MTSU Provost Brad Bartel says MTSU with its current facilities has been a sleeping giant with regard to the study of science and the successful completion of research. "We've been stymieing science for decades here," says Bartel. "Particularly for our people who deal at the molecular level, it's going to make a huge difference to MTSU."

During academic year 2009-10, MTSU granted almost 700 degrees in biology, chemistry, and related fields. University officials estimate that number could increase by 25 percent after the new Science Building is in operation.

President Sidney A. McPhee says those additional science graduates will fill high-technology jobs and teach science and math in K-12 schools. "This will enhance middle Tennessee's regional economy by providing technical entrepreneurs and researchers who launch small businesses through ideas and research; make MTSU and the state more competitive for federal grants and contracts in

all areas of science, technology, engineering, and mathematics; and support greater collaboration with the Oak Ridge National Lab through MTSU's new science doctoral programs," he says.

"As home to the state's largest undergraduate student population, the new Science Building is critical to our continuing efforts to provide Tennessee with graduates ready for the 21st century workforce. As communities, like the middle Tennessee area, strive for high-tech jobs and try to attract business and industry, particularly in the life sciences area, a facility like this will go a long way for us attracting students."

(excerpted from the groundbreaking ceremony program)



Groundbreaking Ceremony, May 3, 2012 for the new Science Building

Progress on the new Science Building



September 13, 2012



January 18, 2013

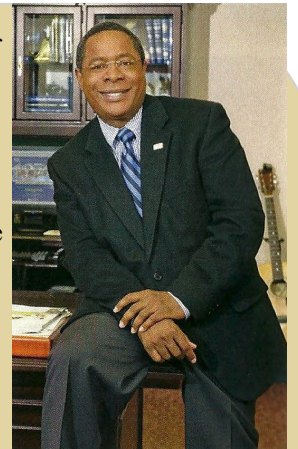


April 8, 2013

This project has been the number-one priority of this University even before my arrival as president 11 years ago. As home to the state's largest undergraduate student population, MTSU needs this \$147-million Science Building. It is critical to our continuing efforts to provide additional science graduates to fill high-technology jobs, prepare more teachers for math and science in K-12 schools, and enhance the economy of our region and state.

We appreciate the efforts by the executive and legislative branches of Tennessee's state government to include funding for the construction of the Science Building in this year's budget. Our thanks go to Gov. Bill Haslam, Lt. Gov. Ron Ramsey, House Speaker Beth Harwell, and the entire Tennessee General Assembly, particularly our Rutherford County delegation: Sen. Bill Ketron, Sen. Jim Tracy, Rep. Joe Carr, Rep. Pat Marsh, Rep. Mike Sparks, and Rep. Rick Womick. We also thank Mayor Tommy Bragg of Murfreesboro and Mayor Ernest Burgess of Rutherford County for their strong support of this effort.

We also acknowledge the tireless efforts put forward by our friends, supporters, students, faculty, and staff in advocating and supporting this vital investment in the future of our University. We shall begin work immediately on this important project so it will be ready for classes by the 2015 spring semester. Today's ceremony is a remarkable capstone to our yearlong Centennial Celebration and, once completed, this building will be a major milestone of our second century of service.



Dr. Sidney A. McPhee

(excerpted from the groundbreaking ceremony program)

From the lab of John DuBois

Graduate student, **Rebecca Davis**, successfully defended her thesis on November 2, 2012. Her thesis is the culmination of a two-year study into the photosynthesis rate and stomatal conductance of KY31, KY32 and Max Q fescues in response to high temperature stress.



Graduate student, **Misty Griffith**, is continuing her research on isolating Atrazine-degrading bacteria. To date, she has found a few candidates that show promise. Her research has also involved the help of **Dr. Mary Farone** in assessing the degradation of Atrazine in culture.

Undergraduate student, **Annie Gintzig** completed her Honors Thesis, "ICD-10: The Next Y2K for Healthcare?" Her project investigated the United States' preparations for the transition from ICD-9 to ICD-10, the coding system used by hospitals, physicians and clinics for diseases, symptoms, complaints, and any abnormal findings in connection with a particular patient. Annie researched the advantages and disadvantages of the ICD-10 systems, along with physician and hospital receptiveness to the transition. She successfully defended her thesis this spring.

Recently Completed Theses:

Davis, Rebecca. 2012. Effects of High Temperatures ($\geq 35^{\circ}\text{C}$) on Mean Photosynthetic and Stomatal Conductance Rates in Endophyte Infected (EI) and Endophyte Free (EF) Tall Fescue. 106p.

From the lab of Wayne Rosing



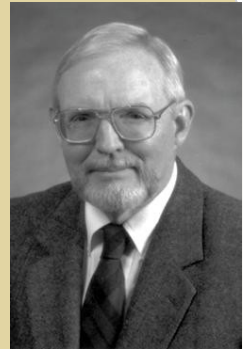
Dr. Rosing continues his research on Myxomycetes by investigating tree bark from various regions worldwide. He has recently submitted a manuscript on the Myxomycetes of Myanmar authored by Ko Ko (Thailand), Rosing, and Stephenson (University of Arkansas).

He is currently investigating bark from an arid region of Southern Australia. Soon, he expects to receive substrates from high and dry areas of Peru. These substrates (as with others) will be moist-chambered for recovery of corticolous (bark-inhabiting) Myxomycetes.

Rosing's biggest news is that he will be retiring this summer (2013) after the May session. He has been teaching and conducting research at MTSU for 32 years.

From the lab of Charles McGhee

Dr. McGhee continues his research on the taxonomy of the Phalangid (Arachnida) genera *Leiobunum* and *Hadrobunus*. He recently published a new species description, *Leiobunum hoffmani* sp.n., in the Journal of Arachnology. The species is named for Dr. Richard Hoffman, a well-known invertebrate zoologist and taxonomist who recently passed away.



He has been busy curating and updating the department Collections in Entomology and Invertebrate Zoology. Last fall semester, Dr. McGhee supervised 16 student field problems in entomology.

He worked with the Tennessee Academy Of Science Fellows Committee (as Chairman) on the 2012 nominations for Fellow of the Academy. They submitted 5 nominees for the 2012 TAS meeting at Vanderbilt University. That meeting represented the 100th year for TAS as a science academy. In addition, he was recently (October, 2012) inducted into the MTSU Golden Raiders Alumni Society.

From the lab of Brian Miller



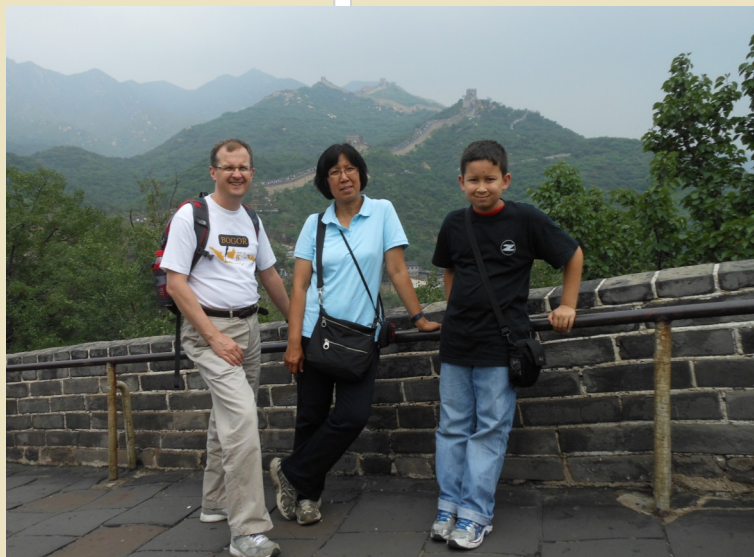
Dr. Miller continues to collaborate with former students, Matt Niemiller, Brad Glorioso, and George (Richie) Wyckoff. Miller, Glorioso and Wyckoff were contributing authors to a book co-edited by Niemiller, "The Amphibians of Tennessee." A companion volume, "The Reptiles of Tennessee" co-edited by Niemiller and Miller is slated for publication early in 2013. Gloioso and Wyckoff will again be among the list of contributing authors.

From the lab of Jeffery Walck

The highlight for Jeff and his family this past year was traveling to China and South Korea. Flying into Shanghai and going on a 3-hour bus trip to Hangzhou, Jeff, wife Siti and their son Edwin visited the Biology Department at Hangzhou Normal University and saw local attractions, such as West Lake. A 6-hour bullet train ride took them to Beijing, where they were guests of Dr. Zhenying Huang of the Institute of Botany, Chinese Academy of Science. Besides spending time discussing research with him and his Ph.D. student, Mr. Ruiru Gao, they saw many sights, such as, the Forbidden City and Tiananmen Square, Olympic Park, Summer Palace, Ming Dynasty Tombs, and the Great Wall.

From Beijing they flew to Incheon, South Korea to meet up with Professor Eun Ju Lee and his Ph.D. student, Ms. Ji Suk Lee, at Seoul National University to discuss her research. Then, along with Ms. Lee and Mr. Youngsung Joo, a Ph.D. student at Max Planck Institute for Chemical Ecology (Germany), they traveled to Jeju Island off the southern tip of the Korean Peninsula. There, they hiked through forests at the Geomunoreum Lava Tubes, were guests at Halla Arboretum, climbed to Seongsan Ilchulbong Peak (a volcanic tuff cone), and raced around Udo (cow) Island on ATVs (before departing for the mainland). They also spent time with colleague Dr. Jae-hyeun Kim and his family visiting Namiseom (Nami Island).

International collaborations are keeping Jeff and Siti busy, working on several manuscripts with colleagues from Australia, Japan, India, and Taiwan. Jeff has been named as a Collaborator on grants with Dr. Gehan Jayasuriya funded by the National Science Foundation of Sri Lanka (investigating mangrove seed germination) and with Dr. Tetsuya Kondo funded by the Japan Society for the Promotion of Science (studying complex seed dormancy). He currently has one Ph.D. student in the lab, Mr. Thilina Fernando, and is serving as a co-advisor on student projects at the University of Peradeniya (Sri Lanka) and at the University of Western Australia.



Jeff Walck, Siti Hidayati, and Edwin at the Great Wall of China.

Recent Publications:

- Walck JL**, Cofer MS, Jayasuriya KMGG, Fernando MTR, **Hidayati SN**. 2012. A temperate rhamnaceous species with a non-enclosed stone and without physical dormancy. *Seed Science Research*, in press.
- Adams DA, **Walck JL**, **Howard RS**, Milberg P. 2012. Forest composition and structure on glade-forming limestones in middle Tennessee. *Castanea*, in press.
- Walck JL**, Karlsson LM, Milberg P, **Hidayati SN**, Kondo T. 2012. Seed germination and seedling development ecology in world-wide populations of a circumboreal Tertiary relict. *AoB PLANTS* 2012: pls007 (1-15); doi: 10.1093/aobpla/pls007.
- Hidayati SN**, **Walck JL**, Merritt DJ, Turner SR, Turner DW, Dixon KW. 2012. Sympatric species of *Hibbertia* (Dilleniaceae) vary in dormancy break and germination requirements: implications for classifying morphophysiological dormancy in Mediterranean biomes. *Annals of Botany* 109: 1111–1123.

Recently Completed Theses:

- Flanigan, Noah**. 2012. Winter warm spell effects on seed germination of among native and exotics plants in a riparian community. 29p.
- Plant, Billy**. 2012. Relationships among soil properties, species richness, and plant coverage in cedar glades of middle Tennessee. 38p.

Graduate Teaching Assistants for 2012-2013

For the 2012-2013 academic year, the department is providing support to 27 M.S. level and 21 Ph.D. level graduate students who serve as Graduate Teaching Assistants (GTA). Twenty two of these students have received undergraduate degrees from colleges and universities other than MTSU. Eighteen of this year's assistants hold baccalaureate degrees in subjects other than biology (anthropology, biotechnology, botany, chemistry, ecology and evolutionary biology, environmental science, medical technology, microbiology, plant and soil science, political science, psychology, wildlife and fishery science, and zoology). The department is supporting 21 student assistants who are pursuing the Ph.D. degree. Four of these assistants have received baccalaureate or master's degrees from universities outside the United States. All have the requisite training in biology to serve as departmental teaching assistants. Without these GTAs, the department would be unable to offer the numerous sections of the non-majors biology course (BIOL 1030) and the majors freshman courses (BIOL 1110/1120), along with some sophomore and junior level laboratories. The Department is very pleased to have them with us.

MASTERS GRADUATE TEACHING ASSISTANTS

Michael Anderson, B.S., Biology, 2009, Middle Tennessee State University
Griffin Cummings, B.S., Biology, 2011 Middle Tennessee State University
Tracy Ervin, B.S., Biology, 2000 Middle Tennessee State University
Noah Flanigan, B.S., Biology, 2010 Middle Tennessee State University
Dallas Flickinger, B.S., Zoology, 2010 Southern Illinois University
Michael Floyd, B.S., Microbiology, 2008 University of Tennessee
Tiffany Goodman, B.S., Biology, 2010 Middle Tennessee State University
Patrick Havlik, B.S., Biology/Recording Industry, 2012 Middle Tennessee State University
Suzanne Hicks, B.S., Biology/Psychology, 2009 Middle Tennessee State University
Tyler Hill, B.S., Biology, 2009 Middle Tennessee State University
Alyssa Hoekstra, B.S., Zoology, 2008 Auburn University
Megan House, B.S., Political Science, 2006 University of Kentucky
Olukemi Jolayemi, B.S., Biology, 2009 Tennessee State University
Alison Jordan, B.S., Anthropology, 2005 Middle Tennessee State University
Cody Keating, B.S., Biological Sciences, 2007 Louisiana State University- Baton Rouge
Kerri Kluting, B.S., Biology, 2010 Middle Tennessee State University
Rachel Lytle, B.S., Biology, 2012 Middle Tennessee State University
Robert Newby, B.S., Biology, 2005 Middle Tennessee State University
Eric Nordberg, B.S., Wildlife and Fishery Science, 2010 Pennsylvania State University
Katlin O'Connor, B.S., Plant and Soil Science, 2012 Middle Tennessee State University
Andrew Oshodi, B.S., Zoology, 2007 University of Benin (Nigeria)
Haley Pimental, B.S., Chemistry, 2012 Middle Tennessee State University
Patricia Ritchey, B.S., Biology, 2011 Middle Tennessee State University



Graduate Teaching Assistants for 2012-2013

MASTERS GRADUATE TEACHING ASSISTANTS

Matthew Rodgers, B.S., Biology, 2009 Tennessee Tech University

Jacob Sanders, B.S., Biology, 2012 Tennessee State University

Daniel Simpson, B.S., Biology, 2010 Middle Tennessee State University

Jessica Vannatta, B.S., Biology, 2012 Middle Tennessee State University



PhD GRADUATE TEACHING ASSISTANTS

Bhawana, B.S., Biotechnology, 2006 Utar Pradesh Tech University; M.S., Professional Science, 2009 Middle Tennessee State University

Jeff Bonner, B.S., Biology, 2002, University of Georgia; M.A.E., Education, 2010, Cumberland University

Jacob Crigler, B.S., Biology, 2008, University of Tennessee- Knoxville

Christopher Davis, B.S., Biology, 2007, Middle Tennessee State University

Vernon Dodson, B.S., Biological Sciences, 2009, University of Tennessee- Knoxville

Daniel Estabrooks, B.S., Ecology and Evolutionary Biology, 2006, University of Tennessee; M.S., Ecology, Middle Tennessee State University

Thilina Fernando, B.S. 2009, Botany, University of Peradeniya

Chatoria Kent, B.S., Biology, 2004, Middle Tennessee State University; M.S., Biotechnology, 2007, Middle Tennessee State University

Manoj Khadka, B.S., Microbiology, 2004, Tribhuvan University; M.S., Microbiology, 2008, Tribhuvan University

Sandra Lampley, B.S., Biology/Community and Public Health, 2000, Middle Tennessee State University; M.A., Administration and Supervision, 2008, Middle Tennessee State University

Karen Maynard, B.S., Biology/Psychology, 2006, Martin Methodist College; P.S.M., Biotechnology, 2009, Middle Tennessee State University

Yohannes Mehari, B.S., Medical Technology, 2005, University of Asmara; M.S., Microbiology, Jilin University, China

David Owens, B.S., Biology, 2002, Middle Tennessee State University

Hyo Park, B.S., Biology, 2009, Middle Tennessee State University

Melissa Pompilus, B.S., Chemistry, 1998, Northern Arizona University; M.S., Biochemistry, 2001, University of Nevada- Las Vegas

Amy Shaffer B.S., Biology, 2011, Middle Tennessee State University

Megan Stallard, B.S., Biology, 1999, Tennessee Tech University; M.S., Toxicology, 2005, Texas A&M College Station

Angelique Troelstrup, B.S., Psychology, 2000, Middle Tennessee State University; M.S., Quantitative Psychology, 2003, Middle Tennessee State University

Jeannie Stubblefield, B.S., Biology, 2011, Middle Tennessee State University

Caleb Sutton, B.S., Biology, 2011, Tennessee Technological University

Katelyn Walsh, B.S., Environmental Science, 2010, Drexel University; M.S., Environmental Science, 2010, Drexel University

Scholars Week Highlights Research of Faculty and Students

Middle Tennessee State University held its annual Scholars Week March 26-30, 2012. The Department presented 29 posters, an increase over the number presented at the 2011 Scholars Week. Authors on these posters included 17 faculty members, 15 graduate students and 13 undergraduate students, along with eight area high school students.

Awards were given to the top three posters presented by graduate students and undergraduate students from each college. **Nicholas Chamberlain (Jerry Reagan, advisor)** received first place in the graduate student category. **Ashley Wise and Rachel Patton** (along with graduate student **Jeannie Stubblefield, Anthony Newsome, advisor**) received first place in the undergraduate student category. **Danielle Millay (William Stewart, advisor)** received third place in the undergraduate student category.

The faculty members involved in mentoring these students deserve credit for their time, efforts and expertise in these research projects. The poster session was very well-attended by the university community. A large number of people from across the campus were able to see the quality of research being conducted in the Department. Congratulations to all authors for a job well-done!

To see the entire Scholars Week program, along with abstracts from all posters and presentations, visit <http://www.mtsu.edu/research/scholarsWeek/index.php>. Poster authors and titles from the Department of Biology are given below:

Faculty Presentations

Timothy Graeff (faculty; Management and Marketing), Scott Seipel (faculty; Computer Information Systems), Joey Gray (faculty; Recreation and Leisure Services), **Ryan Otter, Kim Sadler**, Karen Petersen (faculty; Political Science), Becky Alexander (faculty; Elementary and Special Education), Lesley Craig-Unkefer (faculty; Elementary and Special Education), and Carol Boraiko (faculty; Engineering Technology) presented “Faculty and Student Perceptions of Online Versus Traditional Courses: A Comparative Study.”

Brian Manning presented “Developing an Artificial Intelligence-Driven Platform for Biomolecular Research.”



Anthony Farone, Alison Carey (graduate student), **Patrick Cusaac** (graduate student), **Julie Folks** (graduate student), **Jessica Matz** (graduate student), **Emily Mattison** (graduate student), **Eric Salmon** (graduate student), **Tiffany Saul** (graduate student), Chasity Suttle (graduate student; Chemistry), Olena James (graduate student; Tennessee State University), **Mary Farone** and **Kim Sadler** presented “TRIAD: Teaching, Research, and Industry Applications to Deepen Scientific Understanding in Middle Tennessee.”



Scholars Week cont.

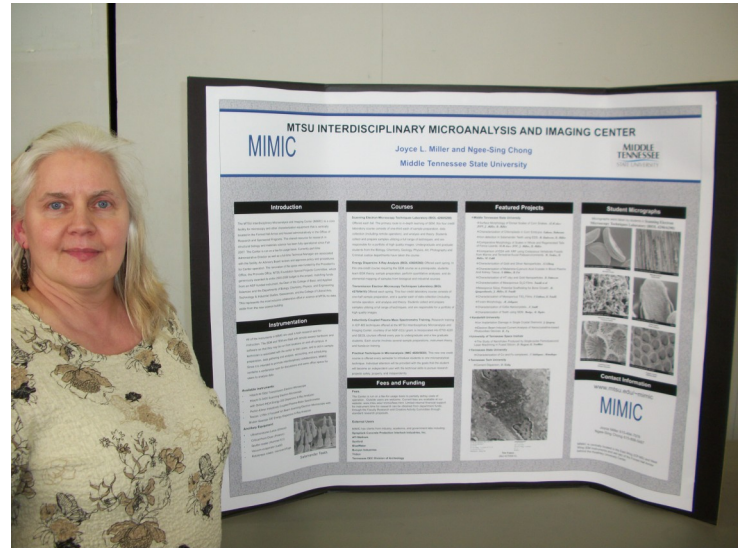
Kim Sadler, Linda Gilbert, Leigh Gostowski, Emily Newton, Wendy Beckman, Elizabeth Bagley presented “After School Science Club: Learning Science Inside the Box, Outside-of-School-Time.”



Kim Sadler presented “The MTSU Center for Environmental Education and Cedar Glade Studies: Online Resources for Formal and Non Formal Educators.”



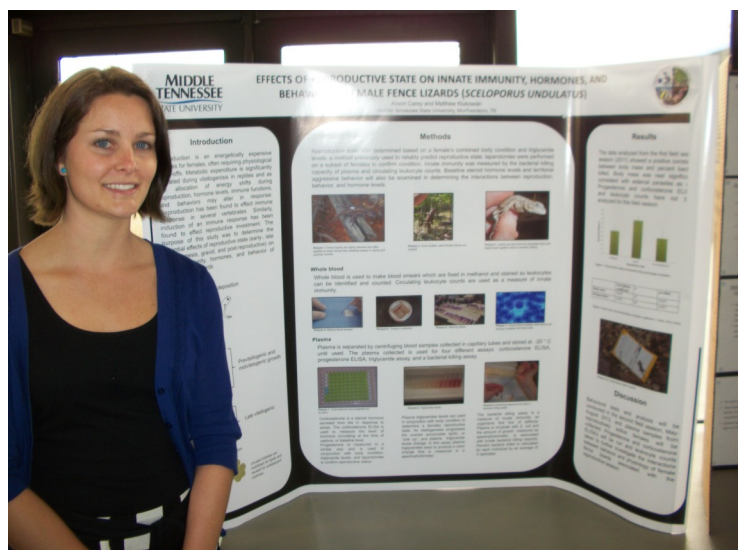
Joyce Miller and Ngee-Sing Chong presented “MIMIC: MTSU Interdisciplinary Microanalysis and Imaging Center.”



Graduate Student Presentations

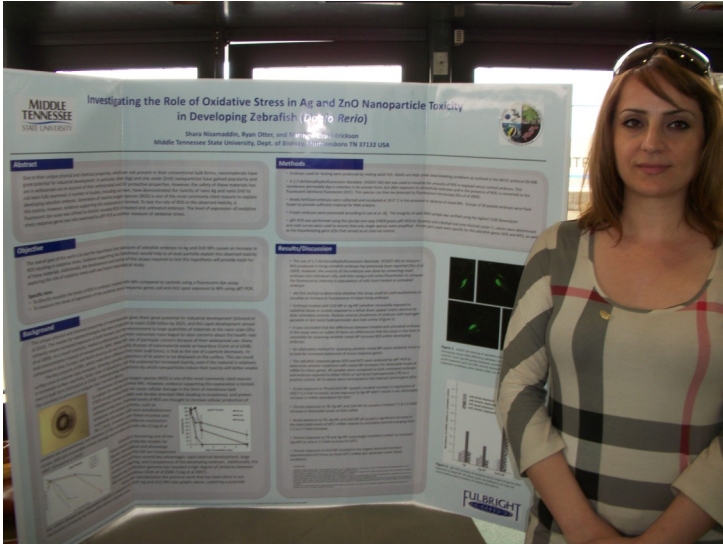
Alison Carey and Jonathan Trundle (faculty; Electronic Media Communication/Photography) presented “Communicating Science Through Photography: An Analogue Perspective.”

Alison Carey and **Matthew Klukowski** (faculty) presented “Effects of Reproductive Starte on Innate Immunity, Hormones, and Behavior in Female Fence Lizards (*Sceloporus undulatus*).”



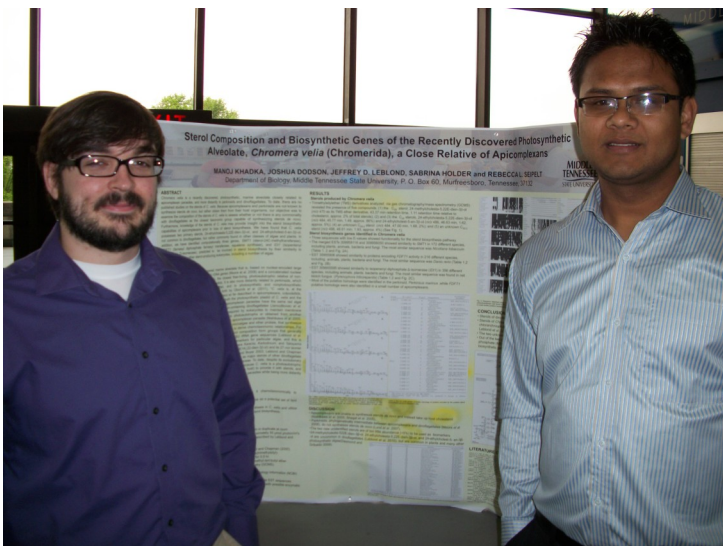
Scholars Week cont.

Shara Nizamaddin, Ryan Otter (faculty) and **Matt Elrod-Erickson** (faculty) presented “Investigating the Role of Oxidative Stress in Ag and ZNO Nanoparticle Toxicity in Developint Zebrafish (*Canio rerio*).”



Patrick Cusaac and Frank Bailey (faculty) presented “Effects of Maternally transferred Methylmercury Chloride on Oxidative Stress in *Nerodia sipedon* Neonates.”

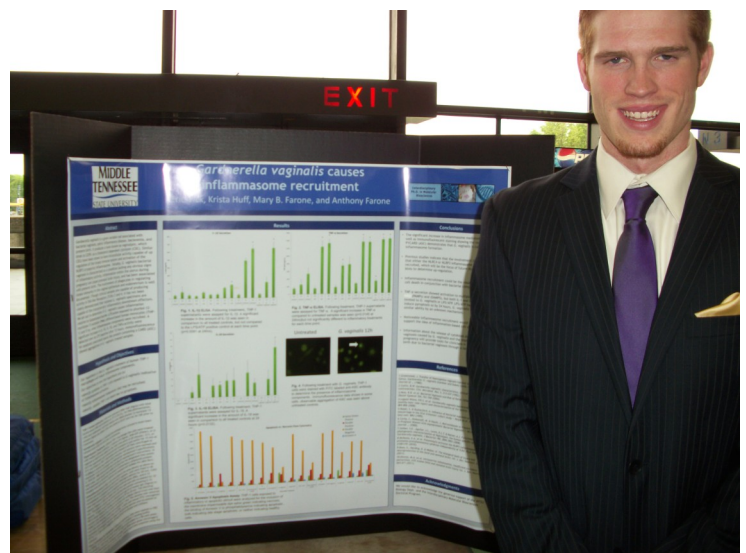
Manoj Khadka, Josh Dodson, Rebecca Seipelt (faculty), **Sabrina Holder** (Undergraduate), and **Jeff Leblond** (faculty) presented “Sterol Composition and Biosynthetic Genes of the Rcently Discovered Photosynthetic Alveolate, *Chromera velia* (Chromerida), a Close Relative of Apicomplexans.”



Tiffany Saul, Anthony Farone (faculty), **Mary Farone** (faculty), **Kim Sadler** (faculty), and **Hugh Berryman** (faculty; Forensic Institute for Research and Education) presented “Forensic Anthropology in the Classroom: A Bare Bones Method for Mentoring.”

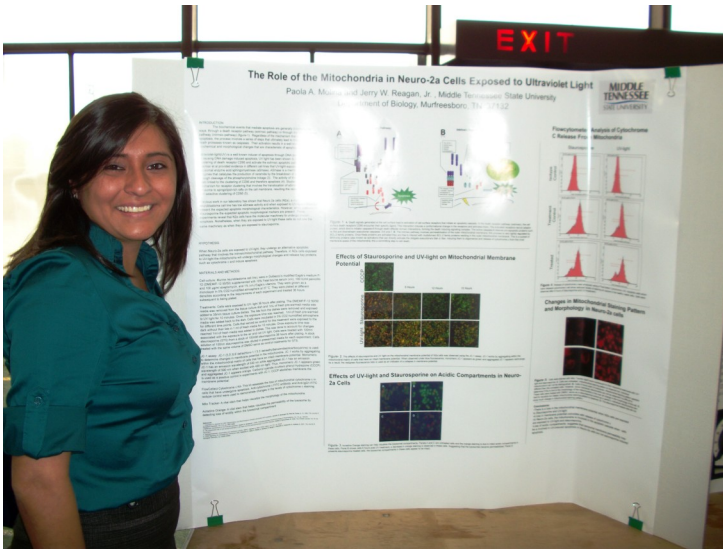


Eric Vick, Krista Huff (Undergraduate), **Mary Farone** (faculty), and **Anthony Farone** (faculty) presented “*Gardnerella vaginalis* Recruits the NLRP3 Inflammasome in Differentiated Monocytes.”

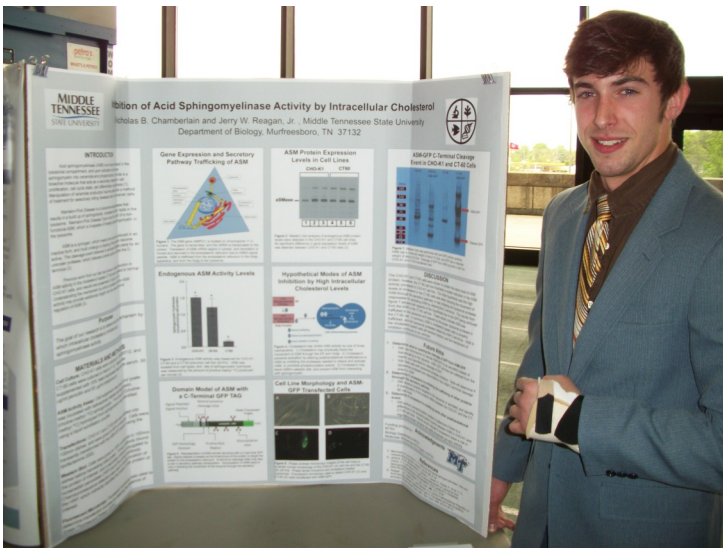


Scholars Week cont.

Paola Molina, Eric Vick, and Jerry Reagan (faculty) presented “The Role of the Mitochondria in Neuro-2a Cells Exposed to Ultraviolet Radiation.”



Nicholas Chamberlain and Jerry Reagan (faculty) presented “Inhibition of Acid Sphingomyelinase Activity by Intracellular Cholesterol.”

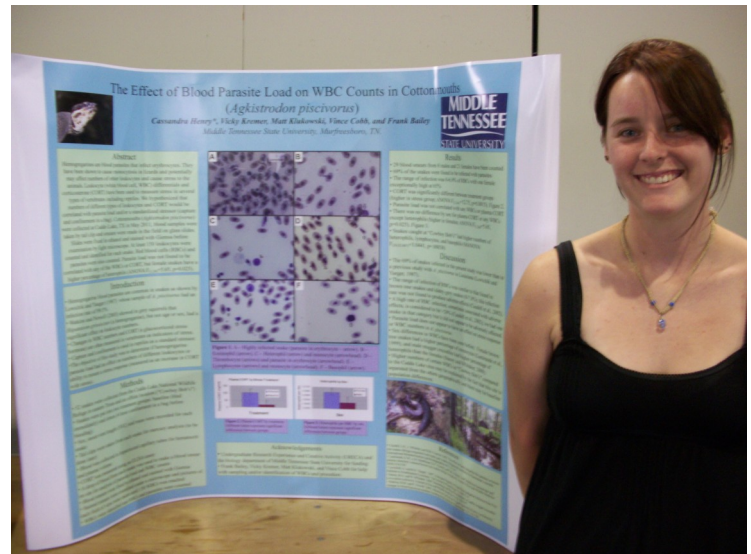


Michael Anderson, Alison Carey, Daniel Estabrooks, Ryan Johnston, and Brian Miller (faculty) presented “Herpetological Surveying in Middle Tennessee.”



Undergraduate Student Presentations

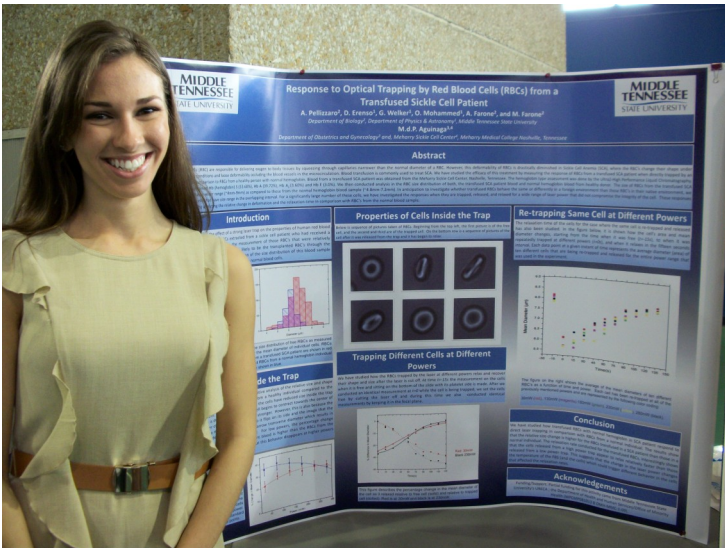
Cassandra Henry, Vicky Kremer, Vince Cobb (faculty), **Matt Klukowski** (faculty), **Frank Bailey** (faculty) presented “The Effects of Blood Parasite Load on WBC Counts in Cottonmouths (*Agkistrodon piscivorus*).”



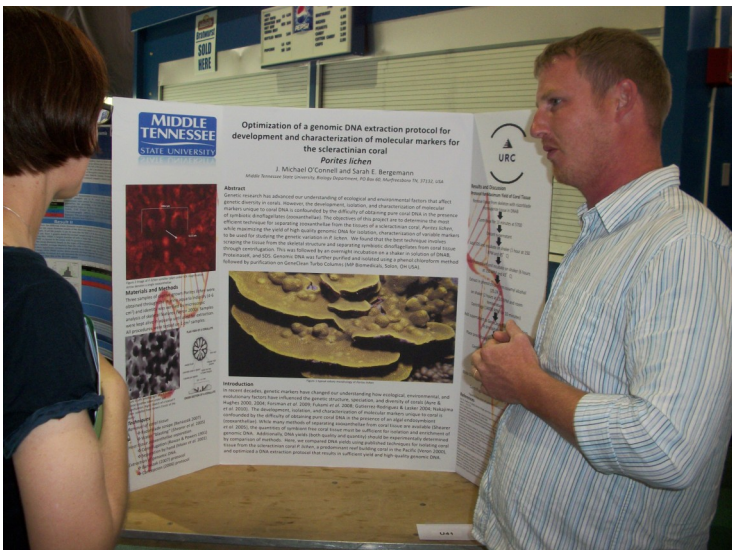
Jennifer Revalee (Undergraduate; Chemistry), **Anthony Farone** (faculty), **Mary Farone** (faculty), **Maria del Pilar Aguinaga** (faculty; Meharry Obstetrics and Gynecology), **Daniel Erenso** (faculty; Physics and Astronomy) presented “Comparative Statistical Study in the Physical Properties of Different Hemoglobin Variant in Sickle Cell Anemia.”

Scholars Week cont.

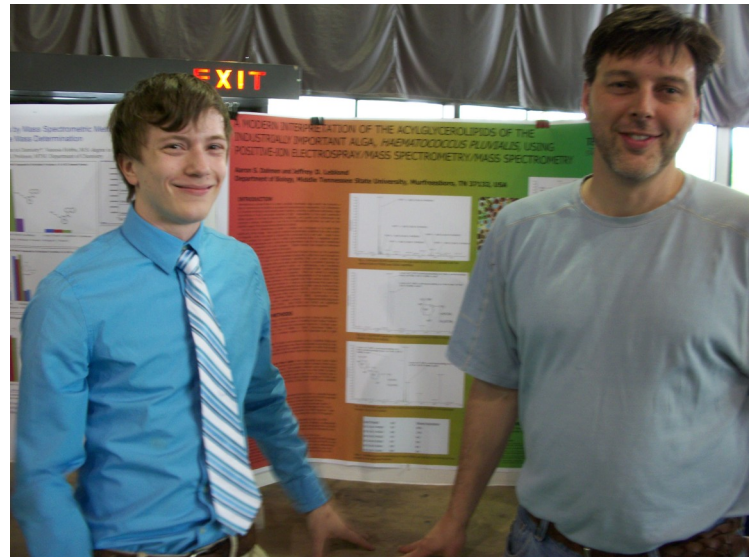
Aline Pellizzaro, Anthony Farone (faculty), Mary Farone (faculty), Maria del Pilar Aguinaga (faculty; Meharry Medical College), Daniel Erenso (faculty; Physics and Astronomy) presented “Response to Optical Trapping by Red Blood Cells from a Transfused Sickle Cell Patient.”



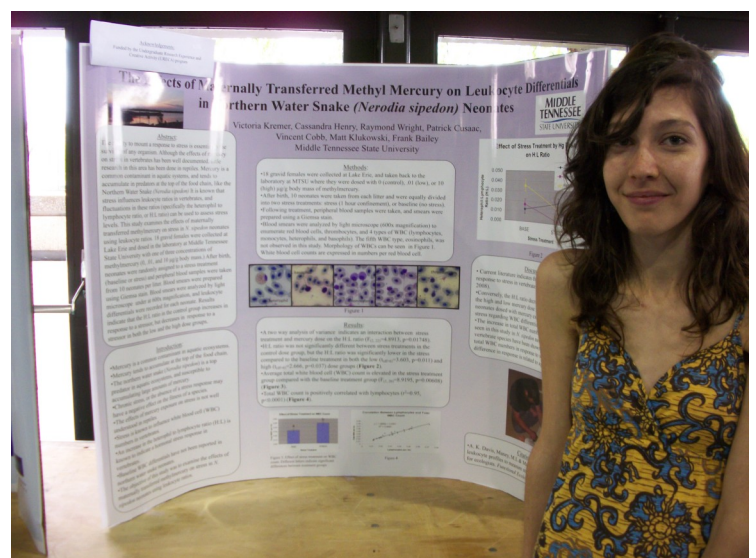
Mike O'Connell and Sarah Bergemann (faculty) presented “Optimization of a Genomic DNA Extract Protocol for Development and Characterization of Molecular Markers for the Scleractinian Coral, *Porites* Lichen.”



Aaron Dahmen and Jeff Leblond (faculty) presented “A Modern Interpretation of the Acylglycerolipids of the Industrially Important Alga, *Haematococcus pluvialis*, Using Positive-Ion Electrospray/Mass Spectrometry.”



Victoria Kremer, Cassandra Henry, Raymond Wright, Patrick Cusaac, Vincent Cobb (faculty), Matthew Klukowski (faculty), and Frank Bailey (faculty) presented “The Effects of Maternally Transferred Methyl Mercury on Leukocyte Differentials in Northern Water Snake (*Nerodia sipedon*) Neonates.”



Scholars Week cont.

Ashley Wise, Jeannie Stubblefield (Graduate), **Rachel Patton**, and **Anthony Newsome** (faculty) presented “Survey of Bacterial Contamination in Ready-to-Eat Foods.”



Samuel Mitchell (Undergraduate; Chemistry), **LaTeasha Hughes, Mohammedali Gangardiwala** (Graduate), **Stephen Wright** (faculty), and **Andrienne Friedli** (faculty; Chemistry) presented “Binding to Mesoporous SiO₂ Films and Solids of Bovine Serum Albumin.”

Brandon Cathey (Undergraduate; Physics and Astronomy), **Jessica Graves, Deporschia Green** (Undergraduate; Engineering Technology), and **William Robertson** (faculty; Physics and Astronomy) presented “Coaxial Cable Metamaterial Based on a Sub-Wavelength Loading by Inductor-Capacitor Resonators.”

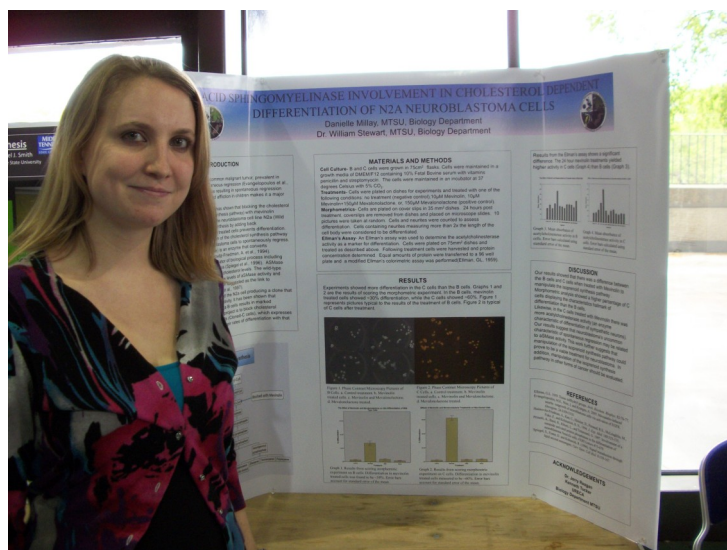
Jarrod Shores (High School Student), **Anthony Farone** (faculty) presented “Growth trends of *Opuntia humifusa* in a Middle Tennessee Cedar Glade.”

Joseph Kennedy (High School Student), **Lauren Pearson** (High School Student), **Amanda Sudberry** (High School Student), **Christina Nicholas** (High School Teacher), and **Anthony Farone** (faculty) presented “Soil Composition of a Typical Cedar Glade Habitat in Middle Tennessee.”

Ashley Hunt, Eric Jackson (High School Student), **Anthony Farone** (faculty) presented “The Effects of *Cladonia ragnifera* and *Nostoc commune* on Plant Growth in Cedar Glace Environments.”

Victoria Cooley (High School Student), **Joseph Flaherty** (High School Student), **Samuel Stockard** (High School Student), **Christina Nicholas** (High School Teacher), and **Anthony Farone** (faculty) presented “Plant and Microbiological Crust Composition in a Cedar Glade Community.”

Danielle Millay and William Stewart (faculty) presented “Acid Sphingomyelinase Involvement in Cholesterol Dependent Differentiation of N2A Neuroblastoma Cells.”



The Next Scholars Week is April 1-5, 2013

Full-Time Temporary and Adjunct Faculty Play Major Roles

The combination of increased enrollments and decreased funding brings a challenge when it comes to assigning instructors to the ever-growing number of course sections. This need is met primarily by full-time temporary and adjunct faculty. This academic year, the department has hired four full-time temporary faculty and seven adjunct faculty. Eight of the eleven temporary/adjunct faculty hold the doctoral degree and three hold Master's degrees.

These faculty are teaching Human Anatomy and Physiology I & II, Exploring Biology (non-majors biology), Radiation Biology, Seminar on Environmental Problems, Non-Flowering Plants, Medical Botany, and Comparative Anatomy of Vertebrates. Considering the expertise of each of these instructors, their students are obviously getting a great education. Their service to the department not only helps fill instructor roles in an ever-increasing number of course sections, but, also they fill in for research faculty that have received grants and/or contracts that include release time. A few of these instructors are using some of their out-of-class time to conduct their own research, often involving graduate and undergraduate students. The department is forever grateful for their service.

Full-Time Temporary

Christopher Brian Manning, B.S., 1996; M.S., 1998; MTSU; Ph.D., 2003, University of Vermont. Teaching: Biology 2011 Anatomy & Physiology Labs

Amy Massengill, B.S., 1993, Stetson University; D.V.M., 1997 University of Florida. Teaching: Biology 2011 Anatomy & Physiology Lab, Biology 3020/5020 Comparative Anatomy of the Vertebrates, and Biology 3021/5021 Comparative Anatomy of the Vertebrates Lab

Mary Matthews, B.S., 1992; M.S., 2002, MTSU. Teaching: Biology 2011 and 2021 Anatomy & Physiology Labs

Teresa Stegall-Faulk, B.S., 1997; B.S., 2000, MTSU. Teaching: Biology 2010 Anatomy & Physiology and Biology 2011 and 2021 Anatomy & Physiology Labs



Adjunct Faculty

Matthew Dodd, B.S., 1999; M.S., 2001, MTSU; Ed.D., 2008, Tennessee State University. Teaching: Biology 1030 Exploring Life

Steve Edwards, B.A., 1973; Ph.D., 1980, University of California, San Diego. Teaching: Biology 2011 Anatomy and Physiology Lab

Cecil Monte Halcomb, B.S., 1969; M.S., 1974, MTSU. Teaching: Biology 1030 Exploring Life and Biology and Biology 3070 Biology Seminar on Environmental Problems

Siti Hidayati, B.S., 1986, University of Gadjah Mada; M.S., 1993; Ph.D., 2000, University of Kentucky. Teaching: Biology 1030 Exploring Life and Biology 3030 Nonflowering Plants

Thomas Hemmerly, A.M., 1955; Ed.D., 1964, Peabody College. Teaching: Biology 1030 Exploring Life and Biology and Biology 4400/6400 Medical Botany

Erin McClelland, B.A., 1992, University of California, Santa Barbara, Ph.D. 2003, University of Utah. Teaching: Biology 2011 Anatomy and Physiology Lab

Jucilene Pereira, B.S., 2000, Universidade Catolica de Pernambuco, M.S., 2003; Ph.D., 2009, Universidade Federal de Pernambuco. Teaching: Biology 4150 Radiation Biology

The Center for Cedar Glade Studies

Middle Tennessee State University
by Kim Sadler



An Invitation: Come and celebrate Cedar Glades! Plan to attend the Annual Elsie Quarterman Cedar Glade Wildflower Festival May 3 and 4, 2013 at Cedars of Lebanon State Park. The weekend opens on Friday afternoon, May 3, with the 8th Annual Research Roundtable followed by an informational evening program and toe-tapping bluegrass music for the general public. Saturday events begin early with a morning bird watching hike, followed by hourly informative natural history programs and guided hikes out to the glades throughout the day. The Saturday evening programs will traditionally have you either hooting or croaking, depending on your preference to join the ‘owl prow’ or ‘frog frolic’. If you are interested in attending the Research Roundtable or the Wildflower Festival and need more information, please contact Jeff Walck, jeffrey.walck@mtsu.edu or Kim Sadler, kim.sadler@mtsu.edu.

Resources: The CCGS office is located in the Fairview building, room 202. Excellent resources are available for those of you that are interested in teaching about the cedar glades, the *Cedar Glade Educator Activity Guide*, *Flatrock Glade Plant Guide*, and DVD are a few sources of information for teaching about limestone cedar glades. Also available if you simply appreciate cedar glades: *Cedar Glade Endemic Plants* poster, *Cedar Glade* pamphlet, and *A Visit to the Limestone Glades* DVD. For any of these resources, contact Kim Sadler, kim.sadler@mtsu.edu or the Center for Cedar Glade Studies, glade-center@mtsu.edu. Electronic copies of these resources are also available on the Center for Cedar Glade Studies Web site: <http://capone.mtsu.edu/gladectr>. Mayo Taylor, an MTSU librarian with experience in conservation, has offered her expertise in updating the CCGS reference collection; the library is currently digitizing dissertations and theses related to cedar glade scholarship. Dr. Elsie Quarterman’s dissertation has been completed and other works not available electronically are in the queue.

Research: Drs. Chris Herlihy and Jeremiah Busch (Washington State University), with funding from NSF, are working on the evolution of self-pollination in the glade endemic *Leavenworthia alabamica*. Another project that is underway is examining flower color polymorphism in *Leavenworthia stylosa* with M.S. student Julie Folk and Ph.D. student Thilina Fernando. Eric Nordberg (M.S. student) is working with Dr. Vince Cobb on the seasonal activity and movements of timber rattlesnakes. Tracking rattlers last summer, he found that some of them traveled up to 1 mile from their hibernation site in Flat Rocks State Natural Area. The Klukowski lab has been conducting several studies on fence lizards (*Sceloporus undulatus*) in the cedar glades. For example, Alison Carey (M.S. student) used radio telemetry to examine the daily movements and habitat usage of lizards during the pre-winter period, and James Pope (undergraduate researcher) helped study how fence lizards respond to environmental stressors. Billy Plant and David Adams finished their M.S. projects (supervised by Drs. Jeff Walck and Steve Howard) on the relationships of glade soil hydrology to vegetation and on the composition and structure of forests on glade-forming limestones, respectively. Dr. JoVonn Hill (Mississippi Entomological Museum) continues his research on a newly discovered grasshopper species, *Melanoplus ingrami*, on middle Tennessee glades.

News from 2012: This past year’s Annual Research Roundtable and Elsie Quarterman Cedar Glade Wildflower Festival were held on 27-28 April 2012 at Cedars of Lebanon State Park. On Friday afternoon, 25 people, representing academia, state and federal agencies, and NGOs, attended the Roundtable. We had several speakers give updates on their research:

David Adams (Stones River National Battlefield) – *Changes in the composition of middle Tennessee forests*

Milo Pyne (NatureServe) – *Vegetation changes in glades at Chickamauga and Chattanooga National Military Park*

David Lincicome (TN Division of Natural Areas) – *Population biology of Pyne’s ground-plum* (from work done by Dr. Matthew Albrecht at Missouri Botanical Garden)

Jennifer Cartwright (Tennessee State University) and Dr. Bill Wolfe (USGS) – *Hydrology and soil biology of cedar glades at Stones River National Battlefield*

The Center for Cedar Glade Studies

On Friday evening, Andrea Bishop (TN Division of Natural Areas) talked about the ginseng program and the recovery of the Tennessee Coneflower (*Echinacea tennesseensis*).

Those attending learned about the efforts of the Rare Plants Protection program efforts to monitor ginseng harvesting and sales. She brought samples of ginseng grown commercially and in the wild; it was amazing to see the difference. Of course, wild-grown ginseng has a higher demand and profit. Andrea also brought everyone up to date with the delisting of the Tennessee Coneflower from the Federal List of Endangered and Threatened Species on 2 September 2011 after being listed in June 1979. This is an example of a conservation success story that was the result of a multi-agency effort. Colonies of Tennessee Coneflowers have been established successfully in multiple locations in Middle Tennessee and natural populations have been preserved.

On Saturday, a good turnout along with a beautiful day made the bird walks and field trips to view glade wildflowers successful. Presentations throughout the day covered reptiles in the glades, butterflies of the glades, glade geology, and caves. The beautiful weather continued into the evening and program participants had multiple opportunities to hear/view owls and frogs throughout the park.



Tennessee cone flowers in bloom at Long Hunter State Park (May 2012). Photo credit: Jason Allen



Elsie Quarterman Wildflower Festival Team takes a break
Left to Right: Kurt Blum, Kim Sadler, Tom Hemmerly, Melissa Turrentine, JosEllen Turrentine, Milo Pyne

Dr. Kim Sadler and her partner teacher collaborators this past year have been busy “rocking out in limestone glades” and have facilitated several Cedar Glade workshops at multiple venues such as the National Science Teachers Association conference, the Tennessee Science Teachers Association meeting, the Integrated Curriculum Conference, and the Tennessee Outdoor Classroom Symposium. Environmental educators attending the TEEA conference enjoyed a scavenger hunt at Flat Rock with Kim in September.

Several local elementary schools have become involved in activities related to the glades located at Flat Rock State Natural area. McFadden second grade students visited Flat Rock in the autumn and spring and “adopted” a glade plant that became the focus of a research project. Students learned about the natural history of their plant and showcased posters at a school-wide event. They also rescued selected glade plants from drainage ditches and transplanted these in a cedar glade garden at the school. They now can study

Missouri evening primrose, Gattinger’s prairie clover, prickly pear cactus, Nashville breadroot, and others in their school garden. Seigel sixth graders learned about glades with Kim’s biology preservice students. Preservice students engaged sixth graders interactively in the classroom and reinforced ecology concepts with students during a hike at Flat Rock Cedar Glades and Barrens. In the *Tennessee Conservationist* (Zepp, 2012) cedar glades were showcased as natural classrooms.

The CCGS supported the Tennessee Parks and Greenways Foundation in the acquisition of a conservation easement for property located in Lascassas that has glade and forested areas. The Wittrig property, purchased more than fifty years ago by a psychologist that worked at the VA hospital, will be protected for posterity. Jeff Walck said it best, “The glade ecosystem at the Wittrigs is a wonderful addition to the network of glades now protected in middle Tennessee. Together, these glades represent one of a few hotspots of endemic plant biodiversity for southeastern United States. Our natural heritage has gained another foothold for generations to come.”

The Center for Cedar Glade Studies

On a final note, the namesake for our annual wildflower festival, Elsie Quarterman, turned 102 on November 28. She is a Vanderbilt University professor emerita that studied and directed scholarly work about the glades for more than 60 years. Her work not only brought worldwide attention to the glades but also informed the public about the need for protection and appreciation of cedar glade areas.



Dr. Elsie Quarterman, 102nd birthday with her great-great grandniece, Chandler Linton. Photo used with permission from Ann Quarterman.

BioUpdate

Lynn Boyd, department chair
John D. DuBois, editor

Key contributors to this issue of *BioUpdate* are Lynn Boyd, Virginia McKnight, George Murphy, Kim Sadler, Cindi Smith-Walters

Produced by MTSU Department of Biology

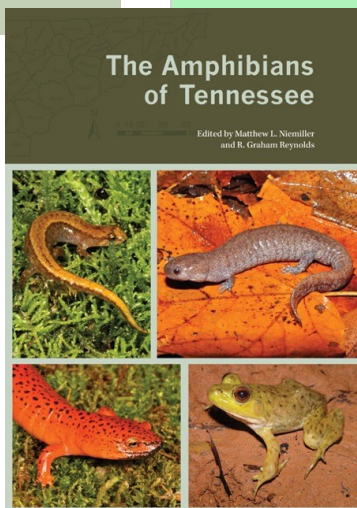
MTSU, a Tennessee Board of Regents university, is an equal opportunity, non-racially identifiable, educational institution that does not discriminate against individuals with disabilities.

ALUMNI making their mark

Jeff Green (M.S.'05) was promoted to Assistant Professor and was awarded Outstanding Faculty at Nashville State Community College in 2010. His current research involves fish behavior, greenway bird populations and fungi-plant symbiosis. His students have present three posters at the Tennessee Academy of Science meetings, placing second in 2009 and third in 2008 and 2009. They will present two more posters at this fall's meeting at Vanderbilt University. Jeff published two natural history notes in *Herpetological Review* in 2011 co-authored with **Vincent Cobb** (MTSU Biology). He also organized and hosted a Critical Thinking Academy of all regional TBR institutions. In addition to teaching majors and non-majors Biology and an independent research course, he is also a contributing writer for *Honest Tune Magazine*, contributing over 20 music album reviews.

William Mahr (B.S.'78; M.S.'79) is the Deputy Chief Administrative Officer for the John P. Murtha Cancer Center at Walter Reed National Military Medical Center, Bethesda, MD. The Center was officially named in a recent ceremony that included the Honorable Nancy Pelosi as one of the guest speakers. William states that the education he received at MTSU has helped him immensely to do this job. On a more personal note, William is expecting grandchild number 5!

Matt Niemiller (B.S.'93; M.S.'06) recently co-edited the book "The Amphibians of Tennessee" with Graham Reynolds. Contributing authors include **Brian T. Miller** (Faculty) and two other alumni, **Brad "Bones" Glorioso** (M.S.'06) and **George "Richie" Wyckoff** (M.S.'06). A companion volume, *The Reptiles of Tennessee* co-edited by Matt, Graham, and Brian is slated for publication early in 2013. Brad and Richie are again among the list of contributing authors.



Sam O'Dell, Jr. (M.S.'98) received his PhD in Science Education from the University of Georgia in summer 2010, and is now employed as an Instructor of Biology at Armstrong Atlantic State University in Savannah, Georgia, teaching general biology and human anatomy and physiology.

Biology Department Scholarship Winners, 2012

Each Year the Biology faculty is honored to be able to work with outstanding students who excel in the classroom, conduct independent research, attend courses at field stations, present papers at scientific meetings, and perform exceptionally well on national standardized tests. To help defray the costs of these activities and to recognize these students, the department is pleased to offer a number of scholarships.

Although these scholarships include monetary awards, their intention is to recognize students for efforts above and beyond the expected. The Biology faculty congratulates each and every student recipient.

Clay M. Chandler Outstanding Freshman Biology Award and Scholarship—Awarded annually to an outstanding student in general biology classes.

Alec Gibson O'Grady

Ralph E. Sharp Outstanding Sophomore Award and Scholarship—Awarded annually to a Biology major of sophomore standing.

Marcelle Albert

Philip M. Mathis Outstanding Junior Award and Scholarship—Awarded annually to a Biology major of junior standing.

Rachel Hart

Peter I. Karl Outstanding Senior Award—Awarded to a Biology major of senior standing who will graduate in May or August, or who graduated in December.

Lauren Layne Masooda Folad

Elliott Dawson/BioVentures Biotechnology Scholarship – Awarded to a Biology major of junior standing or above who has taken, or currently enrolled in Biotechnology.

David Antonelli Laura Morgan

C.W. Wisner Medical/Allied Health Award and Scholarship—Awarded to a graduating student who will continue studies in the medical sciences at a school of medical technology, or other allied health field.

**Darla Emberton Keela Irvin
Sadia Laghari**

Freeman P. Jordan, Jr. Scholarship – Awarded to a Biology major in support of research in Microbiology or Molecular Biology.

Komron MacLean

Charles R. McGhee Scholarship—Awarded to a Biology major of junior, senior, or graduate standing seeking licensure to teach Biology.

Rachel Lytle

Kevin Driver Memorial Scholarship—Awarded to a student of junior standing (minimum of 85 hours earned) with an interest in Organismal Biology, Physical Therapy or Sports Medicine.

Emily Oswald

George Davis Scholarship—Awarded to a non-traditional Biology major of sophomore standing or above.

Riaun Floyd

John D. DuBois Scholarship—Awarded to undergraduate or graduate students to provide travel for paper presentations at scientific meetings.

**Cassandra Henry Raymond Wright
Victoria Kremer**

Mary C. Dunn Graduate Scholarship – Awarded to support research efforts.

Eric Nordberg Kerri Kluting

Charles Holland Biology Club Scholarship—Available to students enrolled in the graduate program

Paul Hollis Eric Nordberg

Sarah Barlow Scholarship—Awarded to graduate teaching assistant who plans to teach at the secondary or college level.

Kerri Kluting

John A. Patten Scholarship - Awarded to a Biology major of sophomore or above (including graduate) standing for research support or summer study.

**Alison Carey Chris Fleming
Paul Hollis Tracy Ervin**

J. Gerald Parchment Scholarship—Awarded to a Biology major of sophomore or above standing for summer study or academic year research.

Chris Fleming Kerri Kluting

Biology Department Scholarship Winners, 2012

Marion R. Wells Graduate Research Scholarship

Awarded to provide support for thesis research conducted during summer months.

Alison Carey **Eric Nordberg**
Paul Hollis

Mitchell Magid – Awarded for students doing research or internships in Organismal Biology

Allison Carey **Kerri Kluting**

George G. Murphy Research Scholarship-

Awarded to an undergraduate or graduate student to purchase supplies or support travel associated with research projects.

Cody Keating **Eric Nordberg**
Jeremy Timbs

Stephen M. Wright Research Scholarship-

Awarded to an undergraduate or graduate student to support any aspect associated with research in microbiology or biotechnology.

Cody Keating

Sarah H. Swain Undergraduate Research Scholarship – Awarded to purchase supplies or support travel associated with research projects.

Komron MacLean **Jeremy Timbs**

Padgett Kelly Research Scholarship – Awarded to an undergraduate or graduate student to support summer studies of field research in ecology or conservation biology.

Chris Fleming

John M. Zamora Graduate Research Scholarship-

To provide support for expenses associated with thesis research.

Cody Keating **Eric Nordberg**

William H. Butler, Jr. Graduate Research Scholarship – To provide support for expenses associated with thesis research

Cody Keating **Eric Nordberg**

Dennis Mullen Vertebrate Biology Aquatic Ecology Research Scholarship-

Awarded to graduate students engaged in research in Vertebrate Biology or Aquatic Ecology.

Eric Nordberg

Thomas Hemmerly Graduate Research Support Fund – To provide travel and/or supplies necessary for thesis research

Cody Keating **Eric Nordberg**
Paola Molina **Paul Hollis**

Brian Miller Graduate Research Scholarship-
Awarded to support research of second year graduate students conducting field studies on Herpetology or Biospeleology in Tennessee.

Eric Nordberg

Major Field Test High Score

Fall 2011 Spring 2012
Amanda Herrod **Sydney Roth**
Kelsey Hill

Incoming Freshman Scholarships 2012-2013

Mary C. Dunn Freshman Scholarships-Awarded annually to an incoming freshman Biology major. Given to the first and second place scorer on a departmental exam given in April each year.

1st place scorer:

Lauren Heusinkveld-Cedar Creek Schoolhouse Academy-Nashville, TN

2nd place scorer:

Grant Vis-Springhill High School, Springhill, TN

Patrick J. Doyle Freshman Scholarship-Awarded annually to an incoming freshman Biology major. Given to the third place scorer on a departmental exam given in April.

3rd place scorer:

Jenna Price-Morristown-Hamblen High School West, Morristown, TN

Ellis Rucker Freshman Scholarship-Awarded annually to an incoming freshman Biology major. Given to the fourth place scorer on a departmental exam given in April each year.

4th place scorer:

Andrew Nolin-Coffee County Central High School, Manchester, TN