

Harold W. Keller, Ph.D., Professor Emeritus, Resident Research Associate, BRIT
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Personal Data

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Family

Married to Dr. Brenda J. Griffith Keller (Ph.D.), March 7, 1965; two sons David Bryant and Brian Lee Keller

Education

The University of Florida Graduate School, Gainesville,
Postdoctoral Fellow based on nationwide competition, 1971-72
The University of Iowa, Iowa City, Ph.D. in Botany, 1967-71
The University of Kansas, Lawrence, M.A. in Botany, 1960-63
Kansas Wesleyan University, Salina, B.A. in Biology, 1960

Academic Experience

2009-present Professor Emeritus, University of Central Missouri, Warrensburg
2006-2008 Visiting Professor, University of Central Missouri, Warrensburg.
1998-2006 Adjunct Professor of Biology, Central Missouri State University, Warrensburg.
1990-present Resident Research Associate, Botanical Research Institute of Texas, Fort Worth.
1990-1998 Adjunct Associate Professor, Department of Microbiology, University of North Texas Health Science Center, Fort Worth.
1983-1990 Associate Professor, Department of Biology, University of Texas at Arlington.
1982-1983 Associate Professor, Department of Biological Sciences, University of North Carolina at Wilmington.
1978-1982 Associate Professor, Department of Microbiology and Immunology, Wright State University School of Medicine, Dayton, Ohio.
1971-1978 Assistant Professor, Department of Biological Sciences, Wright State University
1971 National Science Foundation Fellow, "Summer Institute in Systematics V, Origin and Measurement of Diversity" held at Smithsonian Institute, Washington, D.C.
1967 Instructor, Georgia State College, Atlanta.

Administrative Experience

1998-2002 Director of Sponsored Research and Projects, University of Central Missouri.
1990-1998 Director of Research, Office of Research and Biotechnology, University of North Texas Health Science Center at Fort Worth.
1983-1990 Director, Office of Sponsored Projects, The University of Texas at Arlington.
1982-1983 Director of Research, Office of Research Administration, University of North Carolina at Wilmington.
1978-1982 Assistant/Associate Director, University Research Services, Wright State University, Dayton, Ohio.

Other Experience

1964-1967 Military Service, Captain, United States Army Medical Service Corps, Third United States Army Medical Laboratory, Chief, Mycology/Parasitology, Medical Illustration, Fort McPherson, Atlanta, Georgia, Vietnam Era Veteran.
1967-1971 Graduate Teaching Fellow in Biology, The University of Iowa, Iowa City.

- 1960-1963 Graduate Teaching Fellow in Botany, The University of Kansas, Lawrence.
- 1957-1958 United States Forest Service, Lolo National Forest, fire observer (Diablo Mountain Lookout) overlooked the Selway-Bitterroot Primitive Area, trail crew member constructing Skyline Trail in the Bitterroot Mountains, fire fighter, telephone lineman climbing and hanging telephone line on trees and part of trail-clearing crew.

Teaching military courses at Fort McPherson, Atlanta, Georgia

Instructor of Parasitology in the Medical Laboratory Procedures (Basic 92B10) Course. Graduates of this course were certified as Medical Technologists. Administrative Coordinator for the CONUS Malaria Surveillance Program. I was responsible for diagnostic and consultative parasitological services at Army, Navy, and Air Force installations in Third Army Area (southeastern U.S.A.) and coursework in Medical Mycology and Medical Parasitology, working closely with the Mycology and Parasitology Training Units at the Communicable Disease Center in Atlanta. I was also in charge of the mycological laboratory.

Teaching at the University of Central Missouri

BIOLOGY 3611, Microbiology Lecture (jointly with Dr. Oller); BIOL 1004, Introduction to Sciences: Ecology, Laboratory; BIOL 1112, Plants, laboratory; BIOL 4011, Special Problems in Biology (Tree Canopy Biodiversity); BIOL 4102, Fundamentals of Grant Proposal Development; BIOL 5953, Research in Biology; BIOL 5000, Biology Seminar; BIOL 5011, Special Problems in Biology (Tree Canopy Biodiversity); BIOL 5031, Biological Literature; BIOL 5032, History of Biology; BIOL 5951 Master's Thesis,

Teaching at GSU, WSU, UNCW, and UTA

General Botany, Georgia State University, Introduction to Botany, Principles of Biology: Ecology and Organismic Biology, Honors Recitation as part of University Honors Program, Biology of Lower Plants (mosses, liverworts, algae, fungi and Myxomycetes), Medical Mycology, Microbiology (for nurses), Microbiology of the Human Environment (for nurses), Human Parasitology, Plant Biology, Biology of Economic Plants, Biology of Slime Molds.

Research Interests

Tree canopy biodiversity was surveyed and inventoried for cryptogams (Myxomycetes, macrofungi, mosses, liverworts, lichens, ferns) and other biota such as molluscs, insects, and tardigrades for the Great Smoky Mountains National Park. Biodiversity was surveyed for Myxomycetes in the state of Kentucky, especially the Daniel Boone National Forest and Berea College Forest. Insect tree canopy biodiversity using flight intercept traps and inventory of tree canopy myxomycetes was investigated in Big Oak Tree State Park, Missouri. Myxomycete biodiversity was sampled in selected communities at Ha Ha Tonka State Park, Missouri. Tree canopy ecology of corticolous myxomycetes compared to species of *Vitis* (grapevine) and ground sites. Our floristic myxomycete studies have been concentrated in the southeastern Gulf States of Florida and Georgia and the middle latitude states of Arkansas, Kansas, Kentucky, Missouri, and Ohio and an ongoing cooperative study on the Myxomycetes of New Mexico and Mexico. Scanning electron microscopy, transmission electron microscopy, and energy dispersive spectroscopy are being used to elucidate the formation, deposition, and composition of mineral deposits in the Myxomycetes as this relates to developmental, taxonomic and phylogenetic relationships. The development and use of K through 12 teaching materials for fungi and Myxomycetes was represented by hands on laboratory exercises, books for children, and videos. Recent research has targeted Myxomycete and fungal diversity in Tarrant County Nature Parks, on Botanical Research Institute of Texas campus grounds, Fort Worth Botanic Garden, Fort Worth Nature Preserve and Refuge mostly on the trunk bark of living trees especially American elms.

Objectives of the tree canopy biodiversity research project in Great Smoky Mountains National Park to

- complete the first comprehensive survey and inventory of tree canopy biodiversity from three meters to the upper canopy for cryptogams represented by myxomycetes, fungi, mosses, liverworts, lichens, and ferns as well as other selected insect groups and molluscs in the Great Smoky Mountains National Park;
- assemble a multidisciplinary research team of experts who will collect, identify, and curate this diverse group of organisms and serve as mentors to aid undergraduate and graduate students in the recognition of specimens and collection of bark samples;
- compare the assemblages of tree canopy organisms with those found on ground sites;
- search for species new to science in all of the targeted groups of organisms;

- sample for cryptogams along vertical transects of individual trees at different heights to quantify the association of the relative species composition, abundance, and diversity of these assemblages with the available environmental characteristics (host tree species, vegetation type, height class, light, pH, and humidity);
- compare the tree canopy-targeted groups on different tree species;
- provide research experiences for students that will enhance opportunities for postgraduate study.

This project involved four RUI institutions collaborating in the study of the different targeted groups of organisms with an international component of experts from Sweden, Russia, and Lithuania who provided species identification for specific groups of organisms. Women and minorities, who are underrepresented in field biology research, participated along with volunteers, park interns, citizen scientists, undergraduate and graduate students, and key project personnel in park interpretive exhibitions, website outreach, news media coverage (print and television), and publication of articles in popular magazines as well as peer reviewed journals that sent a powerful conservation message for biodiversity.

Biosketch

Harold W. Keller was born and raised in Kansas. He graduated from Peabody High School and subsequently earned his Bachelor of Arts degree in biology from Kansas Wesleyan University in 1960. The summers of 1957 and 1958 were spent in the Lolo National Forest, Powell Ranger District, as a firefighter, trail crew worker constructing the Skyline Trail in the Bitterroot Mountains, as a lookout observer located at Diablo Mountain Lookout overlooking the Selway-Bitterroot Primitive area, and as a telephone lineman climbing trees, repairing and re-hanging telephone line. These experiences were highlighted with scenic photographs of Powell Ranger District, Lolo National Forest, Idaho published in the Lookout Network magazine and is posted on their website as a featured article. Professor Albert Robinson, Jr. at Kansas Wesleyan University supported his application for a teaching assistantship and graduate study at The University of Kansas. He received his Master of Arts in Botany in 1963 from The University of Kansas under Professor Ronald L. McGregor, who directed his thesis entitled "A comparative anatomical study of the genus *Echinacea*". He became interested in the Myxomycetes in the early 1960s while at The University of Kansas and has actively pursued their collection and study ever since. He earned the rank of Captain in the United States Army Medical Service Corps during the Viet Nam Era from 1964 to 1967. In 1967 he began his doctoral work on Myxomycetes with Professor George W. Martin, who had been in Emeritus status since 1955, but agreed to direct his dissertation entitled "The Genus *Perichaena* (Myxomycetes): A Taxonomic and Cultural Study". In 1971 he received his Doctor of Philosophy degree from The University of Iowa. He had the privilege of being Professor Martin's last student. He was selected as a one-year postdoctoral fellow in a nationwide competition by The University of Florida Graduate School to study the Myxomycetes of Florida. In 1971 he was selected as one of 25 recent Ph.D.'s nationwide to participate as a National Science Foundation Fellow in the "Summer Institute in Systematics V, Origin and Measurement of Diversity" held at the Smithsonian Institute. He has been the recipient of numerous grants, including National Science Foundation grants to support his research entitled "Monographic and Floristic Studies of the Corticolous Myxomycetes" and more recently "Tree Canopy Biodiversity (Myxomycetes, Macrofungi, Mosses, Liverworts, and Lichens) in the Great Smoky Mountains National Park". His research interests are focused on the systematics, floristics and ecology of the corticolous myxomycetes. Myxomycete workshops that highlight the collection and identification of these colorful and fascinating organisms are given at national and international meetings. In 1996 he delivered the invited Plenary Address entitled "Biosystematics of Myxomycetes: A Futuristic View" at the Second International Congress on the Systematics and Ecology of Myxomycetes in Madrid, Spain. He delivered the keynote address at ICSEM 7 and ICSEM 8 (read in absentia). As a volunteer at the River Legacy Living Science Center in Arlington, Texas, he served as an interpretive trail guide for children and adults and as an instructor for outdoor education programs. In 1991 he received the Alumni Achievement Award from his alma mater, Kansas Wesleyan University, for outstanding accomplishment in a chosen field of research and administration. He also served from 1992 to 2001 on the Kansas Wesleyan University Board of Trustees. He serves as a Resident Research Associate, Botanical Research Institute of Texas, Inc. Fort Worth, Texas, from 1990 to the present. His current and past professional memberships include the Mycological Society of America, the North American Mycological Society, the Association of Southeastern Biologists, Southern Appalachian Botanical Society, Sigma Xi, The Scientific Research Society, The Mycological Society of Mexico, The British Mycological Society, and International Canopy Network. He has a special interest in the development and use of K through 12 teaching materials for fungi and Myxomycetes represented by laboratory exercises, videos, and books. He has taught a number of different botany courses at several universities, including "Organismic Biology (Honors Sections)"; the "Biology of Lower Plants", "Plant Biology", "Biology of Economic Plants"; "Microbiology", and "Biology of Slime Molds". His recreational activities include ranching, raising cattle, fishing, hunting, collecting fungi, playing racquet ball, water aerobics and swimming, and listening to choir music.

Undergraduate Wright State University Students

Mary J. Buben-Zurey, Undergraduate Honors Project, Commander, U.S. Navy; David M. Smith, Undergraduate Honors Project, WSU-SOM, M.D.; Justin G. Mills, Independent Study Project, WSU-SOM, M.D., David Kinne, Independent Study Project, Supervisor, Cargill Laboratories, Laura L. Anderson; Independent Study Project, The Ohio State University, M.D.

University of Central Missouri Undergraduate Students

More than 20 undergraduate and graduate student climbers have participated in the Adventure Phase, 10 in the Laboratory Phase, and 8 in the Publication Phase of this Tree Canopy Biodiversity Research Project since the summer of 2000. There are 14 experts from 6 universities in the United States of America and 3 foreign countries (please see publications list). Undergraduate student research projects include James "Buck" Counts, doctoral student at Michigan State University, Laura Henley with national guard unit; Melissa Skrabal, doctoral student at Missouri State University, Erica Parker, Damon Lesmeister, Ph.D. from Southern Illinois University, Mike Ferro, Ph.D. from Louisiana State University, Kasie Holder, Kelly Lepert (Earth Science), Prairie Matthews, Sarah Nuernberger, and Danny Pacholski. Students were involved at all levels of the tree canopy biodiversity project: climbing and sampling from the tree canopy, laboratory culture of bark samples, and publication of data. Kenny Snell, former graduate student climber and tree canopy biodiversity GSMNP project leader, was the instructor for the double rope climbing technique. Tree climbing school was held all-day on Saturday, April 24, 2004 at Pertle Springs, the nature preserve for UCM. Charly Pottorff, a professional arborist from Manhattan, Kansas, was the instructor who taught knot tying, proper use of tree climbing gear, and how to advance to the highest possible position in the tree canopy. The following students attended both sessions: Cheryl L. Dunham, Scott Dear, Thomas A. Fayet, Jr., Erin Fanning, Amber C. Ferguson, Matt Laurer, Daniel Marx, Dustin Moore, Ashley Willard. Safety was emphasized repeatedly during the school. Nobody was injured in the field forays beginning the summer of year 2000 and more than 500 trees climbed. Cheryl Dunham, Thomas Fayet, Erin Fanning, Amber Ferguson, and Ashley Willard went on the trip to GSMNP the summer of 2004. Drs. Joseph Ely, Harold W. Keller, and Stephen Wilson also attended the tree climbing school as well as Trish and Stan Smith who interviewed the students and took digital images of the activities for the iAdventure for Warrensburg Middle School life science 7th grade students. Another tree climbing school was held May 12 and 13, 2006 at Pertle Springs. Kenny Snell was the instructor and undergraduate student (Angela Scarborough) and three graduate students (Chris Crabtree, Sydney Everhart (currently Assistant Professor in Plant Pathology at the University of Nebraska, Lincoln and Courtney Kilgore) participated.

Undergraduate Angela R. Scarborough Receives ASB and UCM Awards

Announcement published in *The Inoculum*, supplement to *Mycologia* and official newsletter for the Mycological Society of America. The Association of Southeastern Biologists (ASB) held their 67th Annual Meeting at Gatlinburg, Tennessee March 29-April 1, 2006. Research presented as oral platform presentations were part of 272 abstracts organized into two symposia and 26 paper sessions. Poster abstracts (171) were published in *Southeastern Biology* Volume 53, Number 2. Angela R. Scarborough, undergraduate student in the Department of Biology, Central Missouri State University received the Quarterman/Keever Award. The "official" name for this award is the Elsie Quarterman-Catherine Keever Award. It is given by the Southeastern (SE) Chapter of the Ecological Society of America (ESA) for the best ecological poster presented by a student at the annual meeting of the Association of Southeastern Biologists (ASB). This award was given for the first time in 2005. Both undergraduate and graduate students are eligible; the student must be the sole or senior author. The poster must deal with a clearly ecological topic and should represent substantially completed work. It is to be presented in a regular contributed poster session. The award carries with it a cash prize of \$300 and an engraved plaque, which comes from voluntary contributions from members of the SE Chapter of the ESA, as well as any other interested supporters. Scarborough, A.R. 2006. Tree Canopy myxomycetes: patterns of distribution. *Southeastern Biology* 53 (2): 299-300. (Poster Presentation). Angela also received the UCM Sigma Xi best undergraduate research paper award based on her paper "Species Assemblages of Tree Canopy Myxomycetes Related to Bark pH." She also was recognized as the Outstanding Tri-Beta Member and served as President of our UCM Chapter.

The Association of Southeastern Biologists Award in Microbiology is sponsored by the Thomson Learning Brooks/Cole Publishing Company, Belmont, California. This award recognizes an undergraduate or graduate student for an especially meritorious oral presentation of research results in the broad area of Microbiology. The recipient (Angela R. Scarborough) received a check for \$500 and a plaque with her name engraved on it. Scarborough, A.R. 2006. Species assemblages of tree canopy myxomycetes related to bark pH. *Southeastern Biology* 53 (2): 79-80. (Oral Platform Presentation). Harold W. Keller served as the research mentor. More information about this tree canopy project is available at this web site address faculty.ucmo.edu/myxo/.

Writing across the Curriculum at UCM recognizes Angela R. Scarborough as a Distinguished Student Writer, April 10, 2006. Certificate presented at awards ceremony plus \$50, April 13, 2006 at 3:00 pm in UN 237A. Tree Canopy Biodiversity Paper.

Central Missouri Scholars Symposium 2006, April 3-5, 2006. Angela R. Scarborough presented an oral power point presentation entitled “Species Assemblages of Tree Canopy Myxomycetes Related to Bark pH” and a poster presentation entitled “Tree Canopy Myxomycetes: Patterns of Distribution”. Her poster received the first-place award as one of the 61 posters exhibited. Winners received \$100 and a plaque at a recognition luncheon Wednesday, April 12, 2006 at noon in UN 237B.

Undergraduate student Erica E. Parker received the first-place award at the University of Central Missouri for her paper “Correlation of pH with Assemblages of Corticolous Myxomycetes in Big Oak Tree State Park” published in the Journal of the McNair Central Achievers Program, Vol. XII (Issue 1): 4-8. Erica represented the Department of Biology and her paper was reviewed by a university-wide committee. Professor Harold W. Keller, Department of Biology served as her research mentor and co-author of the paper.

Undergraduate student Melissa Skrabal: was part of the tree canopy biodiversity team in Great Smoky Mountains National Park. She discovered a myxomycete species new to science in the tree canopy and perfected her climbing skills to top out in the tallest trees. She graduated in 2001 from the then Central Missouri State University Magna Cum Laude. Her writing skills resulted in preparing narrative passages for different papers published in peer reviewed journals. She was the glue that held together our tree canopy research team.

Undergraduate student Damon B. Lesmeister: Tree climber, discoverer, collector of *Polypodium appalachianum* (a fern) that led to co-authorship of a peer reviewed paper published in the American Fern Journal. He reached the highest point in the canopy exceeding 140 feet in a giant tulip poplar tree. Part of a tree canopy biodiversity team in the Great Smoky Mountains National Park. He graduated from Central Missouri State University in 2004 with a B.S. in Biology and minor in Chemistry, *Cum Laude*. He graduated from Southern Illinois University in 2013 with a Ph.D in zoology and emphasis in Wildlife Ecology. Currently he is working as a wildlife research scientist for the US Forest Service in Corvallis, Oregon with the Wildlife Ecology group at the Pacific Northwest Research Station

Undergraduate student Vanessa Marshall, undergraduate student at the University of Alabama, participated at BRIT in the summer internship program 2017; research mentorship for Myxomycetes and curation of the Myxomycete Collection at BRIT, (see BRIT web site www.brit.org), for posted blog story “My Summer Education: The Microscopic World”

Graduate Student Accomplishments

Kenneth L. Snell (Kenny) was the graduate student and project leader in charge of all phases of the field and laboratory research. His master’s thesis was entitled “Vertical Distribution and Assemblages of Corticolous Myxomycetes on Five Tree Species in the Great Smoky Mountains National Park”. He was nominated for the Reid Hemphill Outstanding Scholar Award based on scholarship, research and citizenship. His thesis was nominated for the Graduate Thesis Award. Nominees were selected by a committee in the College of Arts and Sciences; final selections were made by a University-wide committee. Kenny Snell represented the Department of Biology as the winner of both awards. He received two plaques with his name engraved on them and also cash awards in a special Graduate Awards Reception. His thesis was presented at the Fourth International Congress on Systematics and Ecology of Myxomycetes in August, 2002 as part of the Symposium on “Tree Canopy Biodiversity of Myxomycetes and Corticolous Myxomycetes” held in Meise, Belgium. His thesis was published in the best peer reviewed international scientific journal in our field MYCOLOGIA and a peer reviewed regional journal CASTANEA (please see publication list). He currently is a fulltime faculty member in the Biology Department at Maplewood Community College in Kansas City.

Sydney E. Everhart graduated from the University of Iowa and started working on her research project at UCM the Fall Semester of 2005 and graduated May, 2007. Sydney received the Association of Southeastern Biologists Research Award in Microbiology sponsored by the Thomson Learning Brooks/Cole Publishing Company, Belmont, California. This award recognizes an undergraduate or graduate student for an especially meritorious oral presentation of research results in the broad area of Microbiology. She received a check for \$500 and a plaque with her name engraved on it. Her published abstract: *Everhart, S.E., H.W. Keller, J.S. Ely. 2007. Ecology of Canopy Myxomycetes (true slime molds) on Trees and Grapevines (*Vitis aestivalis* and *V. vulpina*).

Southeastern Biology 54 (3): 275. This was an Oral Power Point Presentation (Abstract) and Best Paper Presentation. Harold W. Keller served as her research mentor. She also received the Elsie Quarterman-Catherine Kever Award sponsored by the Southeastern Chapter of the Ecological Society of America and given for the best ecological poster. She received a check for \$500 and a plaque engraved with her name. Sydney received the Most Outstanding Graduate Student Award for the UCM Department of Biology in May, 2007. Sydney was the first-place recipient of the Outstanding Graduate Student Thesis awarded by the UCM University Research Council. Her thesis was entitled "Assemblages and Distribution of Corticolous Myxomycete Species in the Tree Canopy of Selected Forests in Kentucky and Tennessee". She received an honorary plaque and a \$300 monetary award. Sydney was a doctoral graduate student in the Department of Plant Pathology at the University of Georgia at Athens. Sydney accepted a teaching/research fellowship at the University of Georgia at Athens (Fall, 2007) that supported her Ph.D. obtained August, 2012. She was a USDA AFRI-NIFA Postdoctoral Fellow, Department of Botany and Plant Pathology, Oregon State University. This position is funded by a grant that Sydney wrote, submitted and was awarded after a highly competitive process (AFRI-NIFA Postdoctoral Fellowship Grant, USDA, \$130,000). Her research focused on the "Genomic characterization of population variation of 92 *Phytophthora ramorum* isolates to infer origin, migration pathways, and evolution throughout the USA and worldwide". She recently was appointed Assistant Professor in the Department of Plant Pathology at the University of Nebraska-Lincoln after a highly competitive search. She was promoted early to Associate Professor with tenure in 2019.

Christopher D. Crabtree, a Native American Cherokee, graduated from Missouri Southern State University. His Master's Thesis submitted to UCMO was entitled "Macrofungi, Myxomycetes, Vegetation, and Soils Associated with Five Terrestrial Natural Communities at Ha Ha Tonka State Park, Missouri" near Camdenton, Missouri. Ha Ha Tonka State Park (HAT) consists primarily of dry chert woodlands and dolomite glades. Karst Natural Areas include caves, sink holes (Black Sink and Red Sink), and other geological formations (The Devil's Promenade) that contain numerous microhabitats. Chris was presented with the Best Graduate Student Poster Award at the Central Scholars Symposium, April 2-4, 2007, and the Most Outstanding Graduate Student Award for the University of Central Missouri, Department of Biology in May, 2007. The Missouri Department of Natural Resources Annual Meeting held at Tan-Tar-A, Osage Beach, Missouri had a poster contest (30 entries) and Chris was judged the Winner. His award was presented by the Missouri Chapter of the Society for Conservation Biology, January, 2008. Chris received the University of Central Missouri College of Science and Technology William L.Vacek Graduate Student Research Award. The award is given to a graduate student who has conducted outstanding research during the course of his/her graduate study. Chris received an engraved plaque and a \$500 monetary award. Chris was recognized as the outstanding graduate student at the annual University of Central Missouri Department of Biology and Earth Science Annual Banquet April, 2008. This is the second year in a row Chris has received this honor. The UCM Sigma Xi Chapter honored Chris at their Spring Banquet April, 2008 for the best graduate research paper entitled, "Macrofungi, myxomycetes, and soil attributes associated with five communities at Ha Ha Tonka State Park, Missouri." Chris was the second-place recipient of the Outstanding Graduate Student Thesis awarded by the UCM University Research Council. His thesis award consisted of a honorary plaque and a \$200 monetary award. Grant awards from the Missouri Department of Natural Resources and the National Science Foundation supported his thesis project financially. Chris served as a Natural Resource Steward at Big Oak Tree State Park located in Mississippi County of southeastern Missouri. He also has resource management duties at Morris State Park and Towosahgy State Historic Site. He currently serves as the Natural Resources Steward-Missouri State Parks located at administrative headquarters at Jefferson City.

Courtney M. Kilgore graduated from the University of North Carolina-Pembroke Spring Semester, 2006. She was part of our student tree climbing team in the GSMNP and Daniel Boone National Forest in Kentucky. She and Sydney took part in a climbing demonstration for the Great Smoky Mountain Association Annual Meeting held at the Purchase Knob facility in GSMNP, August 5, 2006. The title of her thesis research was "Aerial Reproductive Structures of Vascular Plants as a Microhabitat for Myxomycetes". Courtney received the Nahm Award for the Outstanding Graduate Student from the University of Central Missouri College of Science and Technology. The selection criteria included a major in a graduate program within the College of Science and Technology and demonstrated performance in leadership, scholarship, and citizenship. Courtney received an engraved plaque and a \$500 monetary award. One highlight of our tree canopy biodiversity research showed CMK as a black and white image collecting bark samples in the tree canopy along with a caption on the front cover of the July, 2008 issue of Southeastern Biology, Volume 55, Number 3. photograph by Robert Breshears. The Mycological Society of America (MSA) held their annual meeting at Pennsylvania State University (PSU), August 10-13, 2008. Each year there is a t-shirt design contest open to all MSA members. The winner has their design featured on the official conference t-shirt, posted on the MSA website, and included in the next issue of the national newsletter, *Inoculum*. Courtney submitted a pencil sketch design in black and white that was selected as the contest winner. Four edible mushroom cultivars were included in the winning design, Shiitake (*Lentinula edodes*), Hen of the Woods (*Grifola frondosa*), button mushroom and Portabella white and brown variety (*Agaricus bisporus*), and the velvet foot mushroom (*Flammulina velutipes*), the latter three are native to the United States of America. The design style was reminiscent of early taxonomical drawings and scientific illustration, with a classic art nouveau border to frame the design. Molds adorn the outer edge represented by *Penicillium*, *Trichoderma*, *Alternaria*, *Fusarium*

and *Aspergillus*. Courtney was inducted as a full member in the UCM Chapter of Sigma Xi. She was an instructor at UCM, Maplewood Community College, and several other community colleges in the Kansas City area. She currently is an Instructor of Biology at Robeson Community College, Lumberton, North Carolina

Visiting Scientists

Jean D. Schoknecht, Ph.D., Associate Professor, Indiana State University, Department of Life Sciences and Department of Botany and Plant Pathology, Illinois Natural History Survey, spent her sabbatical leave during 1987 working with me.

Uno H. Eliasson, Ph.D., Professor and Director, The Botanical Museum, University of Gothenburg, Sweden, supported by the Swedish National Science Research Council to study Myxomycetes in my laboratory from September to October, 1987, June, 1991, and August, 1993.

Takami Hatano, Ph.D., Professor of Biology, Department of Biology, Faculty of Education, Mie University, Japan, supported by a grant from the Japan Ministry of Education, September 1, 1993 to June 29, 1994, to study Myxomycetes using scanning electron microscopy as Visiting Professor at the University of Texas Health Science Center in Fort Worth and the University of Texas at Arlington.

Thomas W. Gaither, Ph.D., Professor, Biology Department, Slippery Rock University, Slippery Rock, Pennsylvania, sabbatical leave of nine months, 1997, to study the genus *Diachea* and *Schenella* (found to be a puffball basidiomycete fungus).

Television, Print, and Radio coverage of our tree canopy biodiversity research project

News release prepared by Micheal Greife, UCM Public Relations. This release appeared in our Warrensburg paper and the Kansas City Star. These selections are from our most recent activities.

UCM Biologists Participate in First National Geographic Society and National Park Service BioBlitz

WARRENSBURG, MO (July 5, 2007) – Working in the treetops offers a unique perspective on life above the forest floor. For a group of University of Central Missouri biology students, making scientific discoveries that will receive worldwide recognition make it even more unique, adding a new level of excitement to already thrilling adventures.

A team of UCM students, faculty and alumni, recently received the honor of being invited to participate in the first NGS-NPS BioBlitz in Rock Creek Park, (May 18 and 19, 2007) Washington, D.C. Making the trip were Harold W. Keller, visiting professor of biology, principal investigator and myxomycologist; Angela Scarborough, an undergraduate biology student from Higginsville, Mo.; Sydney Everhart, a recent UCM master's degree recipient in biology from Atlantic, Iowa; Courtney Kilgore, a graduate student from Fayetteville, N.C.; Kenneth Snell, a UCM alumnus and instructor in biology at Maple Woods Community College who was the group's climbing instructor; Joseph Ely, assistant professor of biology and plant ecologist and biostatistician; and Robert Breshears, a recent UCM photography graduate and graduate student in the Department of Communications.

The BioBlitz, a 24-hour marathon of intensive nature study, is not a new concept. In fact, the UCM Wildlife Society has held its own BioBlitz in the past at Pertle Springs. However, the opportunity to collect and catalog as many species as possible within the limits of a 24-hour time period and the boundaries of a specified area is always exciting and a challenge.

It is the double rope climbing technique used to ascend into the treetops that has brought the UCM team recognition, as well as prior grant funding from the National Science Foundation, National Geographic Committee for Research and Exploration, and Discover Life in America to explore the tree canopy in the Great Smoky Mountains National Park. The double rope technique is commonly used by foresters and arborists. A climbing saddle, system of knots, and a climbing rope installed over a tree crotch, enables the climber to advance and reach heights over 40 meters to collect bark samples with mosses, liverworts, lichens, fungi, and myxomycetes. This climbing technique requires special instruction, and the safety of the climber and ground crew is always a priority. The UCM team attracted a crowd while working in the tall tree canopy near the entrance to Rock Creek Park. Choosing the location was no accident, according to Keller, who saw the opportunity to educate the public about the double rope climbing technique as he entered the park.

"It was a perfect location for us to demonstrate our climbing techniques," Keller said. "People were curious as they entered the park, and we met and had great conversations with some very interesting people." The event drew media coverage, and interest in the UCM team's research and activities that resulted in a photo of Everhart on the front page of the Metro section of the May 19th issue of the *Washington Post*. Perched in her harness in the treetops, Everhart collected tree bark samples that would be transported

to the laboratory at UCM where moist chamber cultures provide conditions that encourage the growth of myxomycetes and other organisms.

The National Geographic also shot video footage, which will be included in an August Public Broadcasting Service broadcast, Episode 236 of National Geographic's *Wild Chronicles*. The invitation to participate in the first national BioBlitz came as a result of coverage of Keller and his student's research during past summers in the Great Smoky Mountains National Park. Keller has introduced a number of UCM students to tree canopy research and the double rope technique, resulting in front-page coverage in the Knoxville, Tenn., *News-Sentinel*.

Keller has conducted field research on myxomycetes for more than 35 years, and he and his student Snell pioneered research on tree canopy myxomycetes in the Great Smoky Mountains National Park in 2003. Keller does research with students in Ha Ha Tonka State Park and Big Oak Tree State Park in Missouri, the Daniel Boone National Forest in Kentucky, and the Great Smoky Mountains National Park in Tennessee and North Carolina. Students also participate in special activities such as the BioBlitz, the first lichen Bio-Quest in the Great Smoky Mountains National Park, and tree canopy research projects with 7th grade life science students, and their teacher Patricia Smith at Warrensburg Middle School.

UCM students who participate in the tree canopy research are well-trained in a tree climbing school held at the university's Pertle Springs natural outdoor laboratory area. The training sessions were conducted by Charly Potorff, a professional arborist who also conducted the final skills test that allowed each student to participate. Students demonstrate physical conditioning by running the stadium steps in the university's Audrey J. Walton football stadium.

"Tree canopy research is one of the last frontiers of research on the planet earth," Keller said. "No one is searching for this group of organisms using the double rope climbing technique to access the tree canopy." The Rock Creek Park BioBlitz participants returned to their home venues with samples to analyze. To date, nearly 700 species have been tallied, with more to come as they work in their laboratories.

"This is an opportunity for students to understand scientific methodology by conducting original research," Keller said. "They are able to participate in an 'adventure phase,' a 'laboratory phase,' and a 'publication phase,' leading the way for successful completion of future studies and doctoral degrees. Our UCM students represent role models and inspiration for the next generation of tree canopy biologists."

"Smoky Mountains Treetop Exploration" airs on PBS television "Wild Chronicles".

A University of Central Missouri research team from the Department of Biology was featured on the PBS program "Wild Chronicles" broadcast on or around Feb. 22 as Episode #318 on PBS television stations nationwide. Entitled "Smoky Mountains Treetop Exploration," the 5-7-minute segment is taken from footage filmed by National Geographic Society television producer Jason Orfanon during July, 2007 in the Great Smoky Mountains National Park. Boyd Matson serves as the host and narrator. The day and time of the broadcast may vary from station to station. The storyline documents the exploration of the tree canopy using the double rope climbing method by the UCM research team. Two graduate student climbers, Sydney E. Everhart and Courtney M. Kilgore, demonstrate how to access, climb, and gather samples (myxomycetes, macrofungi, lichens, mosses, liverworts, and ferns) from the tree canopy. Dr. Harold W. Keller, visiting professor of biology at UCM, coordinates the ground crew and serves as the principal investigator for the research project titled "RUI: Biodiversity and Ecology of Tree Canopy Biota in the Great Smoky Mountains National Park."

National Geographic Weekend Radio Program

The name of the new radio program is National Geographic Weekend with host Boyd Matson. A twenty-minute interview between Boyd Matson, Harold W. Keller, and graduate student Courtney M. Kilgore on February 12, 2008 highlighted our rope climbing exploration of the tree canopy in Great Smoky Mountains National Park. This program series "takes you to the far corners of the planet and the hidden corners of your own backyard". The only Missouri radio station that airs NG Weekend is WBGZ-1570AM in St. Louis at 6:00 pm on Saturdays.

Magazine Article

"Out on a Limb" by Carolyn Jourdan

Our tree climbing team (Sydney E. Everhart and Courtney M. Kilgore) was the subject of a storyline that highlighted their tree climbing demonstration for the Great Smoky Mountains Association annual meeting (about 100 people), August 5, 2006, at Purchase Knob in the Great Smoky Mountains National Park. The full story and color images can be found under Humerous Blogs at this link: http://www.smokiesinformation.org/05f_blogs.htm \. This was also published in a popular magazine:

Jourdan, C. 2007. Out on a Limb. The Iowa Horticulturist. Vol. 23(2): 10-11, including images of myxomycetes photographed by Sydney E. Everhart. The front cover color image featured Sydney E. Everhart with her climbing gear.

Television Story "A Study with a View" running time five minutes is part of WBIR's Heartland Series. Bill Landry is the host/narrator and co-producer since the Heartland Series was conceived in 1984 to commemorate the 50th anniversary of the founding of the Great Smoky Mountains National Park. This program includes five-minute features that celebrate the people and the land of the entire Appalachian region. The Heartland Series has a 30-minute time-slot airing each Saturday at 7:30 p.m. on WBIR Channel 10 in Knoxville, Tennessee. The television crew spent two half days shooting the climbing and sampling techniques. Many of the panoramic views were shot from a cherry picker with the cameraman in the bucket up to 80 feet.

A special feature television story entitled "Field Research at Pertle Springs" was filmed by the University of Central Missouri KMOS (Public Broadcasting Service) at Pertle Springs, a 200-acre outdoor teaching and research laboratory near our campus. The film crew interviewed Warrensburg Middle School 7th grade life science students and UCM faculty during their field sampling activities September 28, 29, 2004. Students were involved in collecting insects, using insect sweep nets and flight-intercept tree canopy insect traps. More than 100 7th grade students used sampling protocols which included obtaining bark from living trees for laboratory moist chamber cultures. Students were assisted in part by their parents, Drs. Ely, Keller, and Wilson, CMSU undergraduate students, and their teacher Trish Smith. This film story aired on KMOS October 9, 2004 as part of a weekly series, "University Magazine", with a running time of five minutes and thirty-five seconds.

The Warrensburg, Missouri newspaper, The Daily Star Journal, Warrensburg, MO, Monday, August 20, 2007, Welcome Back Feature Section. UCM Biologists Participate in First BioBlitz. Other articles in THE DAILY STAR-JOURNAL Vol. XCII, No/ 167, September 30, 2004, ran two color images under the banner headlines about our Pertle Springs biodiversity study with Warrensburg Middle School life science 7th graders. The captions following the heading "Local Nature Lesson" described the 7th grade students' collecting activities at Pertle Springs. Our project with the WMS 7th grade students was featured in Central Today, Winter 2004, Vol. 4, No. 3, page 4 with an article entitled "More than a Bug's Life Fascinates These Students", including images of Trish Smith, students, and myself showing collecting and sampling techniques. Another article ran in the THE DAILY STAR-JOURNAL Vol. XCII, No 204, Page 2, "Grant Offers Experience in Science" that highlights the collaborative project between UCM and WMS 7th grade life science students. More than 100 students were transported to Pertle Springs to sample for insects and myxomycetes in the Fall, 2005. I spent several entire days in class with the students and Trish Smith assisting with location, observation, and identification of myxomycetes and other organisms. The enthusiasm shown by the students really makes my day when I hear words like "that's awesome" and "that's cool". THE DAILY STAR-JOURNAL Vol. XCIII, No 180, October 21, 2005 ran a color image under the banner headlines entitled "Junior Scientists at Work". This was a great group of kids!

UCM TODAY, Alumni publication of the University of Central Missouri, summer 2007, vol. 7 no. 1, "Mold Search Taken Students to Extreme Tree Heights" Pages 3-5.

NEWSPAPER ARTICLES

The following newspapers sent staff reporters and photographers to spend a day with us in the field. The *Marysville Times* did a piece entitled "Researchers Inventory Biodiversity in the Smokies" that also went out on the Associated Press Wire Service. *The Mountain Press* ran an article on the front page entitled "Finding their own 'Island in the Sky'." *The Tennessean* from Nashville ran a special nature feature story in the Sunday edition entitled "Researchers climb to new heights in Smokies." *The Knoxville News-Sentinel* did a major story that ran under the banner headlines on the front page entitled "Rising to the occasion: Park's treetops are site of life-form research." A color photograph of Melissa Skrabal using the double rope technique about 25 m up in the canopy covers the top half of the page. Our own *The Daily Star-Journal* in Warrensburg, Missouri ran a piece in a special edition to welcome back students entitled "Great Smoky Mountains Provide Great Opportunities." In all of these cases the reporters interviewed the students for their impressions and interpretations of their climbing and observations in the tree canopy. In every case the National Science Foundation Biotic Surveys and Inventories program was cited as the source of support in a document that outlined the objectives distributed to the staff reporter.

TREE CANOPY BIODIVERSITY PROJECT LOGO

Undergraduate student climber Melissa Skrabal designed and rendered the colored sketches for our tree canopy biodiversity logo. This logo was made into a cloth patch to provide research team members, volunteers, park personnel and interns, reporters, and friends with a memento of our research project. Our logo recognizes the support of the National Science Foundation and Biotic Surveys & Inventories and our home institution Central Missouri State University. We have distributed over a 100 of these patches that are posted on bulletin boards, worn on blazers or jackets, or help to identify our gear bags or backpacks. Please visit our website at <http://faculty.ucmo.edu/myxo/> to read student stories about their tree canopy adventures.

EDUCATIONAL BOOKS FOR CHILDREN

A book entitled "Fungi" introduces a new series of Ranger Rick books called Exploring Our World by Mary Kay Carson published by Newbridge Educational Publishing in 2003. This series of books introduces and explores key earth, life and physical science and geography concepts for children in grades 3 to 5. This book has photographs printed in magazine size as well as big book size, which can be shared at the front of a classroom. Topical highlights include "Exploring for Fungi" that features Melissa Skrabal collecting lichens high in the treetops in the GSMNP. Another section highlights the discovery by Melissa of a new myxomycete species of *Diachea*. This is an example of a woman in science doing fieldwork that requires strength, agility, and athleticism to scale the heights of champion-sized trees. Melissa represents a role model for other women to follow in her footsteps. This publication sends a powerful message about the importance of biodiversity and the role of fungi in the ecosystem. I served as an editorial consultant and reader for the content of this publication.

Research Experience for Teachers NSF Supplement Award: Patricia A. Smith is a seventh-grade life science teacher from Warrensburg R-VI School District, Warrensburg Middle School, in Warrensburg, Missouri. She was invited by Dr. Harold W. Keller of the University of Central Missouri to apply for a RET supplement to his NSF grant entitled "Biodiversity and Ecology of Tree Canopy Biota in the Great Smoky Mountains National Park". These NSF supplemental awards represent a new program activity that supports participation of K-12 teachers of science and mathematics. The intent of these awards is to facilitate professional development of teachers at the cutting edge of science through strengthened partnerships between institutions of higher education and local school districts.

The objectives of this proposed research are to: allow the teacher to participate in the summer tree canopy biodiversity field research in Great Smoky Mountains National Park; learn the recognition of different taxa, collection techniques, and laboratory culture procedures from a multidisciplinary research team of international experts and participating UCM undergraduate and graduate students; provide the basis for development of parallel research experiences for 7th grade middle school students which will enhance their interest in biology and careers in science; extend the benefits to secondary students world-wide as the student materials and research experiences will be published on the internet as an interactive web-based inquiry activity.

Trish Smith has created a two-tiered website that will allow worldwide access to the field experiences of tree canopy research and allow her secondary students the opportunity to conduct parallel field research in their outdoor laboratory at Pertle Springs near the University campus. The website activities will mirror the three phases: the Adventure Phase, the Laboratory Phase, and the Publication Phase. The first tier of the website, "Exploring Life in the Forest Canopy", is still under construction as minor revisions will be made as a result of field-testing it with the Warrensburg Middle School students, and it will be enhanced with digital movie clips of the training, field research, and interviews with the University of Central Missouri student tree climbers. Anyone who visits the first tier of the website <http://warrensburg.k12.mo.us/iadventure/GSMNPiadventure/> will be able to virtually experience tree canopy research and learn what the All Taxa Biodiversity Inventory in Great Smoky Mountain National Park is all about. Interested student groups can then choose to continue to the second tier of the web activities and conduct similar field research in their region. Students were divided into four major groups and then subdivided into task groups of one or two students. Professors and students from both the Biology Department and Education were enlisted to help, as were parents. On September 28th and 29th, 2004, six groups of 20 students were transported to Pertle Springs for one-hour field trips. Moist chamber cultures of bark samples enabled students to observe a living miniature ecosystem composed of myxomycetes, fungi, lichens, mosses, liverworts, green algae, cyanobacterial algae, myxobacteria, tardigrades, insects, nematodes, and possibly other invertebrates. Each fall (years 2004-2007) HWK meets with the Warrensburg Middle School life science seventh grade students (Patricia Smith teacher) to help observe and identify myxomycete species in their moist chamber cultures of bark samples collected from the tree canopy. Student comments like "that's cool" and "that's awesome" really made my day. This past fall (2007) HWK spent November 15, 16, 18, 27, 28, and 30 meeting with six different 7th grade Life Science classes (approximately 120 students) for a total of 18 hours. Four different years and grand total of 520 7th grade students and 72 hours were involved in this activity.

Past and Present Affiliations

The Mycological Society of America, North American Mycological Association, The Ohio Academy of Science, The Association of Southeastern Biologists, Southern Appalachian Botanical Society, International Canopy Network, Sigma Xi, The Scientific Research Society, The Missouri Academy of Science, Texas Mycological Society, The Mycological Society of Mexico, The British

Mycological Society, The Botanical Society of America, American Association for the Advancement of Science (AAAS), National Council of University Research Administrators, Society of Research Administrators.

Honors and Awards

The University of Central Missouri College of Science and Technology recognition as “Outstanding Friend to the College of Science and Technology, March 24, 2008 at a special awards ceremony.

President, University of Central Missouri, Sigma Xi Chapter, 2006 to 2008.

Vice President, University of Central Missouri, Sigma Xi Chapter, 2003-2006.

Nominated and elected to serve as a member of the Kansas Wesleyan University Board of Trustees, Chair of Academic Affairs and Institutional Advancement Committees, 1992-2000

Listed in *Who's Who in American Education*, 5th edition, 1996-97, edited by Marquis

Listed in *Who's Who in the World*, in 12th edition, 1995-96, edited by Marquis Who's Who

Listed in *Who's Who in Science and Engineering*, First Edition, 1991-93, edited by Marquis

Recipient of the Kansas Wesleyan University 1991 Alumni Achievement Award for outstanding accomplishment in the candidate's chosen field of research and administration

Elected Vice-chair/Chair, Section Officer, Botanical Sciences, AAAS/SWARM Div., 1989-90

Elected, Secretary, The UTA Chapter of Sigma Xi, 1988-90

Elected, Admissions Committee, The UTA Chapter of Sigma Xi, 1987-90

Listed in *The Biographical Roll of Honor*, 1986, published by Historical Preservations of America, Inc., Vol. 3.

Listed in *The Directory of Distinguished Americans*, 1986, published by the American Biographical Institute, 4th Ed.

Listed in *The International Directory of Distinguished Leadership*, 1986, published by the American Biographical Institute.

Listed in *The Directory of International Biography*, 1986, published by The International Biographical Centre of Cambridge, England, Volume 19, 1993/94, Edition XXIII

Listed in *Personalities of the South*, 1985, The American Biographical Institutes, Inc. 4th edition

Listed in *Men of Achievement*, 1985, published by The International Biographical Centre of Cambridge, England, Vol. 4

Listed in *Who's Who in the South and Southwest*, 1984, edited by Marquis Who's Who, 19th ed.

Elected as Vice President, Ohio Academy of Science, Plant Sciences Section, 1981

Listed in *Who's Who in the Midwest*, 1980, edited by Marquis Who's Who, in 17th edition

Elected representative from Southwestern Ohio District; member of the Ohio College Biology Teachers Association, 1979

Listed in *American Men and Women of Science*, 1977, edited by Jacques Cattell Press, 13th edition, Vol. 3.p. 2274

Nominated for excellence in teaching award by students and faculty at WSU, 1977

Nominated by membership of The Mycological Society of America as an officer/councilor

Recipient of the single Postdoctoral Fellowship, University of Florida Graduate School, after a nationwide competition, 1972

Tuition Fellowship, Department of Botany, University of Iowa, 1969

Nominated and elected as a member of the University of Iowa Chapter of the Society of Sigma Xi, 1971

Grants-Principal Investigator (PI) or Co-Investigator

Department of Natural Resources, “Fungi, Myxomycetes, and Floral Diversity in Selected Communities at Ha Ha Tonka State Park Missouri”, PI, Award Amount \$16, 268, starting date 05-15-2006 end date 05-09-2008.

National Science Foundation Supplemental Award (Research Experiences for Undergraduates), “RUI: Biodiversity and Ecology of Tree Canopy Biota in the Great Smoky Mountains National Park”, PI, DEB #0343447-Amendment-003, \$8,930, Division of Environmental Biology (DEB), Biodiversity Surveys and Inventories (BS&I) program, award date 09-11-05, 24 months.

National Science Foundation Supplemental Award, PI, "RUI: Biodiversity and Ecology of Tree Canopy Biota in the Great Smoky Mountains National Park", - DEB #0343447-Amendment 002, \$12,500, Division of Environmental Biology (DEB), Biodiversity Surveys and Inventories (BS&I) program, award date 09-22-04, starting date 05-01-04.

National Science Foundation Award, PI. “Research Experience for Teachers (RET)” Supplement to "RUI: Biodiversity and Ecology of Tree Canopy Biota in the Great Smoky Mountains National Park”, DEB#0343447-Amendment 001, \$10,000, Division of Environmental Biology (DEB), Biodiversity Surveys and Inventories (BS&I) program, Patricia A. Smith, 7th grade Life Science Teacher, Warrensburg R-VI Middle School, Warrensburg, Missouri. Award date 06-08-04.

National Science Foundation Award, “RUI: Biodiversity and Ecology of Tree Canopy Biota in the Great Smoky Mountains National Park”, #0343447, \$93,117, Division of Environmental Biology (DEB), Biodiversity Surveys and Inventories (BS&I) program, starting date 05-01-04, 24 months, Harold W. Keller PI, United States of America.

Discover Life in America, "Lichen BioQuest in the Great Smoky Mountains National Park", DLIA Award #2004-06. \$1,051, PI, start date 04-01-2004–ended 03-01-2005.

National Geographic Committee for Research and Exploration, "Tree Canopy Biodiversity in the Great Smoky Mountains National Park", NGS 7272-02, \$23,896, PI, start date 09-0- 2003 – ended 09-31-2006.

Missouri Department of Natural Resources, "Tree Canopy Biodiversity in Selected Missouri State Parks", \$9,520, PI, start date 05-14-2002 – ended 05- 15-2003 (confined to Big Oak Tree State Park).

Discover Life in America, "Tree Canopy Biodiversity (arthropods, macrofungi, molluscs, and myxomycetes) in the Great Smoky Mountains National Park, \$7,386, PI, start date 04-15-2002–ended 12-31-2003.

National Institute of Occupational Safety and Health, "Acquisition of Scientific Equipment", transfer to National Science Foundation Award #0079058, \$66,200, 10-15-2002.

Central Missouri State University, The Florence Hull Greer and Julius J. Oppenheimer, General Studies Presentation Series, Grant Award for lecture visit of Professor Diane Nelson, Ph.D. "Ocean Gems and Dangerous Marine Critters" \$500, October, 2002.

Central Missouri State University, Phi Kappa Phi Supplemental Grant Application, Grant Award for lecture visit of Professor Diane Nelson, Ph.D., "Tardigrades: Bears Without Backbones" \$300, October, 2002.

Discover Life in America Award entitled "Tree canopy biodiversity (myxomycetes, macrofungi, mosses, liverworts, lichens, and tardigrades) in the Great Smoky Mountains National Park" Award Number, DLIA 2001-26. \$3,366, start date 04-15-2001 - ended 05-01-2002.

National Science Foundation, "SGER-RUI: Tree Canopy Biodiversity (Myxomycetes, Macrofungi, Mosses, Liverworts, and Lichens) in the Great Smoky Mountains National Park" Award - #0079058, \$39,910. Division of Environmental Biology (DEB), Biotic Surveys and Inventories (BS&I) program, 04- 30-2000 – 12- 31-2003, Harold W. Keller PI, United States of America and Uno H. Eliasson Co-PI, Sweden.

National Science Foundation, additional amendment August 24, 2000, \$22,280, for three projects funded under the Research Experiences for Undergraduates (REU), PI, ended 12-31-2003.

Heartland's Alliance for Minority Participation-HAMP Grant, Consortium Grant with the University of Missouri-Columbia, National Science Foundation, start date 01-01-1999 to 06-30-2001, \$9,100.

Carolina Biological Supply Company, "Myxomycete Research Enhancement", \$3,500 from 1985 - 1995.

Monsanto Company, "Myxomycete Research Enhancement", \$3,000 from 1986 to 1992.

Carolina Biological Supply Company, "Myxomycetes of North America", \$1,305 from 09-01-1986 to 08-31-1989.

National Institutes of Health, "Minority High School Student Research Apprentice Program" \$18,000, 06-01-1991 to 08-31-1991. Institutional awards from local, state, and national private foundations, Program Director "Minority High School Student Research Apprentice Program" \$17,000, 03-31-1991 to 02-29-1992, Institutional Award from the National Center for Research Resources, Program Director, renewed \$17,000, 03-31-1992 to 02-29-1993, renewed \$17,000, 03-31-1993 to 02-29-1994. National Institutes of Health, "Biomedical Research Support Grant" Institutional award, 04/01/90 - 03/31/91, \$43,927; 04/01/91 - 03/31/92, \$21,342; 10/01/92 - 09/30/93, \$50,000 (special competition).

Swedish National Science Research Council, NRF Programme for Visiting Scientists, "Ultrastructural and Cultural Studies in *Licea* and *Perichaena* (Myxomycetes), with Taxonomic Reconsideration of the Myxomycete Orders Liceales and Trichiales", \$9,492, 1992-1993 to jointly fund Professors Harold W. Keller and Uno H. Eliasson as a visiting scientist for seven weeks in Sweden.

U. T. Arlington, Organized Research Fund, "Corticolous Myxomycetes (Plasmodial Slime Molds): Systematic and Floristic Studies", PI, \$4,000, 1985.

National Science Foundation Equipment Grant, "Acquisition of Microscope Equipment for Research in Biology", \$23,396, RUI 83-11-386, September 1, 1983 to August 31, 1984.

The North Carolina Board of Science and Technology and Governor's Task Force on Science and Technology, Southeastern Regional Forum on Science and Technology - "Passport to the Future through Science and Technology: Mobilizing our Resources", \$2,000, April 14, 1983 to June 30, 1983.

National Science Foundation, "Monographic and Floristic Studies of the Corticolous Myxomycetes", PI, \$22,400, BMS75-19098, 10-01-1975 to 09-30-1978. \$1,000 supplemental funding from NSF, DEB 75-19098 A01.

National Science Foundation Institutional Grant, "Monographic and Floristic Studies of the Corticolous Myxomycetes", PI, \$1,095, 09-13-1974 to 12-31-1975.

Ohio Biological Survey, "The Corticolous Myxomycetes of Ohio", PI, \$918 from July 1, 1974 to 09-30-1975.

Two-member Type Cultures deposited with the American Tyoe Culture Collection

Living two-member pure cultures deposited with the American Type Culture Collection, Rockville, Maryland, during 1987: *Didymium saturnus* Keller, ATCC #64178; *Badhamia spinispora* (Eliasson & Lundq.) Keller & Schoknecht, ATCC #64201; *Didymium annulisporum* Keller & Schoknecht, ATCC #64200; *Badhamia rhytidosperra* Keller & Schoknecht, ATCC #64199.

Keller Publications-Books, Chapters, Journal Papers, Newsletters

References include journal papers, books, book chapters, journal papers at symposia and congress proceedings, published abstracts of oral and poster presentations and invited lectures. *Asterisks indicate student authors (130 publications here).

Keller, H.W. and Ashley Bordelon. 2022. Discovering the Microscopic World of Live Tree Bark: A Model Instructional Experience for Students and Teacher Using a Virtual iAdventure, Teacher Preparation Guide, Student Worksheets, and Moist Chamber Culture How-to Video. *Plant Science Bulletin* 68 (1): about 10 pages (IN PRESS)

Keller, H.W., *S.E. Everhart, and *C.M. Kilgore. 2021. Myxomycetes: Basic Biology, Life Cycles, Genetics and Reproduction. In C. Rojas and Stephenson, S. (eds) "Myxomycetes: Biology, Systematics, Biogeography and Ecology", Chapter 1, 1–45. SECOND EDITION, Elsevier An Imprint of Academic Press, Atlanta, GA

Keller, H.W. 2021. Morel Mushrooms, Macrofungi, Corticolous Myxomycetes, and American Elm Trees. *FUNGI*. 14: (2):23-

Keller, H.W. 2020. THE CROSS SHOT: Grave Peak Lookout, Powell Ranger District, Idaho. *Lookout Network* Vol. 30, No. 3-4: 23.

Perry B.A., **H.W. Keller**, Edward D. Forrester, and Billy G. Stone. 2020. A new corticolous species of *Mycena* section *viscipelles* (Basidiomycota), Agaricales) from the bark of a living American elm tree in Texas, U.S.A. *Journal of the Botanical Research Institute of Texas*. 65(1): 14 (2): 167-185.

Keller, H.W., R. L. Price, B.G. Stone, and E.D. Forrester. 2020. *Arcyria versicolor* of western mountains, U.S.A. (Myxomycetes: Trichiales: Trichiaceae): a morphological and taxonomic study with observations of nivicolous species. *Journal of the Botanical Research Institute of Texas*. 65(1): 14 (2): 435-459.

O’Kennon, Bob, **H.W. Keller**, and B.A. Bunyard. 2020. Observations of the stinkhorn (Phallales: Phallaceae), and other fungi on the BRIT campus in Texas. *Fungi* 13 (3): 41-48.

Lopes-Andrade, C, M.L. Ferro, and **H.W. Keller**. 2020. A New Species of *Cis* Latreille (Coleoptera: Ciidae) from the USA, with Comments on the Use by Ciidae of Stereaceae Fungi (Basidiomycota: Agaricomycetes: Russulales) As Hosts. *The Coleopterists Bulletin*, 74(1): 93-100.

- Keller, H.W.** and V.M. Marshall. 2019. A new iridescent corticolous myxomycete species (Licea: Liceaceae: Liceales) and crystals on American elm tree bark in Texas, U.S.A. *Journal of the Botanical Research Institute of Texas* 13(2): 367–386.
- Keller, H.W.** 2019. Student team-based tree canopy biodiversity in Great Smoky Mountains National Park. *Plant Science Bulletin* 65(1): 28–37.
- Keller, H.W.** and K.L. Snell. 2018. Hunting and collecting Myxomycetes at night with a flashlight. *FUNGI*. 11(2): 43, 44.
- O’Kennon, Bob, D. Benjamin, and **H.W. Keller**. 2018. *Xylobolus frustulatus* (Stereaceae): Developmental Observations, Morphology, and Ecology. *FUNGI* 10 (4): 16–21.
- Keller, H.W.** and K. M. Barfield. 2017. The Great Smoky Mountains National Park: The People’s Park. *FUNGI* 10 (2): 44–64.
- Keller, H.W.**, *S.E. Everhart, and *C.M. Kilgore. 2017. The Myxomycetes: Basic Biology, Life Cycles, Genetics and Reproduction. In: Stephenson, S. and C. Rojas (eds) “Myxomycetes: Biology, Systematics, Biogeography and Ecology”, Chapter 1, 1–40. FIRST EDITION, Elsevier, Atlanta, GA.
- Keller, H.W.**, Bob O’Kennon, and Greg Gunn. 2016. World record myxomycete *Fuligo septica* fruiting body (aethalium). *FUNGI* 9 (2): 6–11.
- Keller, H. W.** 2015. More than 50 years with Myxomycetes (plasmodial slime molds): highlights and review. Taxonomy and Ecology of Myxomycetes. Higher Education Progress. 9–28, Beijing, China. Keynote Address read by someone else at the Eighth International Congress on Systematics and Ecology of Myxomycetes held in Changchun, China (People’s Government of Jilin Province.) Medical problems prevented attendance.
- Multiple authors not credited. 2015. Confirming the identity of the popular prairie cone flower. *The Cattleman: Range and Pasture Issue*. Vol. CI No. 9: 69–70.
- Keller, H. W.** 2014. The genus *Echinacea* (Asteraceae): floral, stem, and petiole morphology. *J. Bot. Res. Inst. Texas* 8 (1): 87–126.
- Carmarán, C., Rosenfeldt, S., Skigin, D., Inchaussandague, M., and **Keller, H. W.** 2013. Autofluorescence and ultrastructure in the myxomycete *Diachea leucopodia* (Physarales). *Current Microbiology*. 67: 674–678.
- Tamayama, M. and **Keller, H.W.** 2013. Aquatic myxomycetes. *FUNGI*. 6 (3): 18–24.
- Keller, H. W.** 2013. Lookout and trail adventures in Powell Ranger District, Idaho (Part 2). *Lookout Network* Vol. 24, No. 1: 14–20.
- Keller, H. W.** 2012. Lookout and trail adventures in Powell Ranger District, Idaho (Part 1). *Lookout Network* Vol. 23, No. 4: 16–19.
- Keller, H. W.** 2012. Myxomycete history and taxonomy: highlights from the past, present, and future. *Mycotaxon* 122: 369–387.
- Keller, H. W.** 2011. Keynote Address: Myxomycete biosystematics: past, present, and future. VII International Congress on Systematics and Ecology of Myxomycetes, 11-16 September 2011, Recife, PE, Brazil. Abstract Volume 35–53.
- Keller, H. W.** 2011. Tales from past forays; importance of habitats. *Earthstar Examiner* 102 (March): 6–7.
- *Crabtree, C.D., **H.W. Keller**, and J.S. Ely. 2010. Macrofungi associated with vegetation and soils at Ha Ha Tonka State Park, Missouri. *Mycologia* 102: 1229–1239.
- Keller, H. W.** and Chris Schardl. 2010. 2010 Mycological Society of America Annual Kentucky Foray. *Inoculum* 61 (6): 17–18.
- Keller, H. W.** and Merlin White. 2010. Tracking Myxomycetes on a Foray at Boise, Idaho. *Inoculum* 61 (4): 31–33.
- Keller, H. W.** and *S.E. Everhart. 2010. Importance of Myxomycetes in biological research and teaching. *FUNGI* 3 (1): 29–43.
- Price, R. L., **H. W. Keller**, and T. Stampfer. 2010. Valles Caldera National Preserve: protecting a cryptogam paradise and a geologic jewel in New Mexico. *Inoculum* 61 (2): 1–4.
- *Everhart, S.E., J.S. Ely, and **H.W. Keller**. 2009. Evaluation of tree canopy epiphytes and bark characteristics associated with the presence of corticolous myxomycetes. *Botany*. (formerly Canadian J. Botany) 87: 509–517.
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Keller, H.W. and F. Candoussau. 1973. Quelques récoltes remarquables de Myxomycetes en France. *La Revue de Mycologia - Museum de Paris* 38: 114–123.

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Keller, H.W., and D.R. Reynolds. 1971. A new *Perichaena* with reticulate spores. Mycologia 63: 405–410.

Keller, H.W. 1970. *Didymium saturnus*, a new myxomycete occurring on strawstacks. Mycologia 63: 1061–1066.

Consultantships

Monsanto Company, 1986 to 1992; Carolina Biological Supply Company 1985 to 1998.

Special Exhibits

2001 to 2008 The GSMNP created a new interpretive exhibition for the Oconaluftee Visitor Center located in Cherokee, North Carolina. It is intended for park visitors and school groups. This Discovery Center exhibition has interpretive text, photographs, illustrations, and hands-on activities that convey biodiversity themes. Exhibition panels have been crafted to provide many different access points for visitors. One station called "Stories from the Field" features audio tracks of scientific researchers, who share their unique perspectives of their ongoing research projects and the value of biodiversity. Our "Tree Canopy Biodiversity" research project in the GSMNP was selected as one of the "Stories from the Field". This exhibit packs a powerful conservation message that will reach the general public and increase the awareness and importance of basic research in the Park.

1979–80 "Association of Science Technology Centers, Traveling Exhibit, entitled, "Animals or Plants? Slime Molds of the Fernbank Forest, Atlanta." by H.W. Keller and R. Simmons. Shown at museums throughout the United States to further the public's understanding of science.

2015 *Echinacea* exhibit at the visitor's center Botanical Research Institute of Texas on display March 30, 2015 until August, 2015 based on a paper published in the Journal of the Botanical Research Institute of Texas entitled "The genus *Echinacea* (Asteraceae): floral, stem, and petiole morphology".

2015 Myxomycete Exhibit at the Botanical Research Institute of Texas commons area on display August 1 to September, featuring water color paintings, specimens, and Keller Myxomycete Collection at BRIT.

World Directory of Myxomycologists

This booklet was compiled by Harold W. Keller and edited by Diana Wrigley de Basanta and Carlos Lado for the Second International Congress on the Systematics and Ecology of Myxomycetes (ICSEM), Real Jardin Botanico, CSIC, Madrid, Spain. This directory of 52 scientist's names, addresses, and additional information was published in booklet form and distributed at ICSEM2. This directory is compiled to facilitate communication, cooperation, and collaboration between persons and institutions interested in the systematics, floristics, and ecology of the Myxomycetes and related organisms such as the protostelids, dictyostelids, and acrasids. A directory of North American Myxomycologists was compiled by Karl L. Braun at the time of ICSEM-5 and is posted on our web site at <http://faculty.ucmo.edu/myxo/>.

Symposia and Congress Proceedings

Mycological Society of America 2004 Annual Meeting held at the University of North Carolina at Asheville, NC, July 17-21, Tree Canopy Biodiversity Symposium organized and convened by Harold W. Keller (six publications here).

Keller, H. W. entitled "Tree Canopy Biodiversity in the Great Smoky Mountains National Park" Published in Program and Abstracts. Page 64.

Keller, H.W., and H.J. Arnott. 1990. Taxonomic Assessment of *Physarum pulcherrimum* and *Physarum roseum* (Myxomycetes, Physarales, Physaraceae) using ultrastructural characters. IMC4, Fourth International Mycological Congress, Regensburg, Germany. Edited by A. Reisinger and A. Bresinsky. Volume IA-27/2: p. 27.

Eliasson, U.H. and **H.W. Keller**. 1990. Relationships in the Liceales. Symposium entitled "Myxomycetes (plasmodial slime molds): Recent Advances in Systematics and Ecology, IMC4, Fourth International Mycological Congress, Regensburg, Germany. Edited by A. Reisinger and A. Bresinsky. Volume IA-18/1: p. 18. Organizer and convener. This was the first organized symposium on the Systematics and Ecology of the Myxomycetes.

Keller, H.W., K.L. Braun, and M.J. Buben-Zurey. 1989. Corticolous Myxomycetes from Cedar Bog: New Records. Pp. 38-39. In R. C. Glotzhober, A Kochman, W. T. Schultz (eds) Cedar Bog Symposium II. Ohio Historical Society, Columbus, Ohio, 95 pp.

Schoknecht, J. D., and **H.W. Keller**. 1989. Peridial Calcification in the Myxomycetes. Pp. 455-488. In R. E. Crick (ed.) Origin, evolution and modern aspects of biomineralization in plants and animals. Proceedings of the Fifth International Symposium on Biomineralization (1986) Arlington, Texas. Plenum Press, New York, 517 pp.

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Abstracts (147) publications here)

Ashley Bordelon, **Harold W. Keller**, Robert J. O'Kennon. 2020. Rediscovery of *Dendrothele* (white crust fungus) in North Texas: The importance of urban tree preservation. Video presentation remotely by SLACK at the Texas Plant Conservation Conference held at BRIT, Ashley Bordelon presenter, Session 1: Floristics, August 13, 1 – 2 PM

Marshall, V.M.(student BRIT intern) and **H.W. Keller (presenter)**. 2018. Myxomycetes on American elms surviving Dutch elm disease in Texas. Texas Plant Conservation Conference held at BRIT, Speaker Abstracts. p. 19.

- Keller, H.W.** and Y. Yajima. 2017. Myxomycetes through the passage of time: highlights of Japanese myxomycetologists. Program and Abstracts Book. Page 54. (Poster Presentation) The Ninth International Congress on the Systematics and Ecology of Myxomycetes (ICSEM 9), Tanabe, Japan.
- Keller, H.W.** and Y. Yajima. 2017. Tree canopy biodiversity in Great Smoky Mountains National Park, U.S.A. Program and Abstracts Book. Page 55. (Poster Presentation) The Ninth International Congress on the Systematics and Ecology of Myxomycetes (ICSEM 9), Tanabe, Japan
- Keller, H. W.** and B. B. Best. 2017. Selection of students for team-building field research projects tree canopy biodiversity in the Great Smoky Mountains National Park. Abstracts Book Page 257. Power point presentation to Education and Outreach, Botany 2017, national meeting held at Fort Worth, Texas, June 24-28.
- Keller, H.W.** 2011. Myxomycete habitats: an overview. Part of a Round Table Discussion as organizer and leader. VII International Congress on Systematics and Ecology of Myxomycetes, 11-16 September 2011, Recife, PE, Brazil. Abstract Volume Page 66.
- Keller, H. W.** 2010. Kentucky myxomycetes: an ongoing survey of ground and tree canopy sites throughout the state. Joint Meeting of the Mycological Society of America and The International Symposium on Fungal Endophytes of Grasses, Power point presentation, University of Kentucky, Lexington, Kentucky, USA, June 28-July 1, 2010, program page 21.
- Keller, H.W.** and *S.E. Everhart. 2009. Evaluation of fossil myxomycetes in amber: a myxomycologists' perspective. *Inoculum* 60: (5): 27. Power Point presentation to Botany and Mycology Annual Meeting Snowbird, Utah, July 25-29.
- Price, R. and **H.W. Keller.** 2009. Cryptogam survey of the Valles Caldera National Preserve: an interim report. *Inoculum* 60: (5): 27. Power point presentation to Botany and Mycology Annual Meeting, Snowbird, Utah, July 25-29.
- Keller, H.W.**, *C.M. Kilgore, A.R. *Scarborough, *S.E. Everhart, and J.S. Ely. 2008. Rock Creek Park BioBlitz, 2007, Washington, D.C., U.S.A.: Student Tree Climbing Demonstrations and Corticolous Myxomycete Tree Canopy Survey in "Wild Chronicles" Television Episode. Sixth International Congress on the Systematics and Ecology of Myxomycetes. Nikita Botanic Garden, Crimea, Ukraine, ABSTRACTS BOOK Page 32.
- Keller, H.W.**, *C.M. Kilgore, *S.E. Everhart. 2008. Tree Canopy Exploration for Corticolous Myxomycetes in the Great Smoky Mountains National Park, U.S.A.: The "Wild Chronicles" Television Series. Sixth International Congress on the Systematics and Ecology of Myxomycetes. Nikita Botanic Garden, Crimea, Ukraine ABSTRACTS BOOK Page 30, 31.
- *Crabtree, C.D., **H.W. Keller**, and J.S. Ely. 2008. Ectomycorrhizal and Saprobiic Macrofungi Associated with Five Natural Communities of Ha Ha Tonka State Park, Camden County, Missouri. *Inoculum* 59(4): 26.
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- *Kilgore, C.M., **H.W. Keller**, J.S. Ely, and S.W. Wilson. 2008. Aerial Reproductive Structures of Vascular Plants as a Microhabitat for Myxomycetes. *Inoculum* 59(4): 39.
- *Kilgore, C.M., **H.W. Keller**, J.S. Ely, and S.W. Wilson. 2008. Variation in Myxomycete Species Assemblages and Richness Related to pH of Living Trees and Herbaceous Prairie Plants. *Inoculum* 59(4): 39. Poster Presentation.
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Keller, H.W., *C.M. Kilgore, *S.E. Everhart, *A.R. Scarborough, J.S. Ely. and C. Pottorff, 2008. The Double Rope Climbing Technique: Tree Canopy Studies of the Great Smoky Mountains National Park, Daniel Boone National Forest, Kentucky, and Pertle Springs, Missouri. *Southeastern Biology* 55 (3): 251. Front cover image showing Courtney Kilgore ascending a white ash tree to collect bark samples.

*Kilgore, C.M., **H.W. Keller**, and J.S. Ely. 2008. Myxomycetes Species Assemblages on Herbaceous Grassland Plants and Interactions of Nematodes with Plasmodia. *Southeastern Biology* 55 (3): 332-333. Poster Presentation.

*Kilgore, C.M., **H.W. Keller**, and J.S. Ely. 2008. Distribution of Myxomycete Species Assemblages on Aerial Reproductive Structures from Living Trees and Herbaceous Prairie Species. *Southeastern Biology* 55 (3): 225.

*Crabtree, C.D., J.S. Ely, and **H.W. Keller**. 2008. Important Soil Attributes Associated with Macrofungi and Vascular Plants among Terrestrial Natural Communities at Ha Ha Tonka State Park, Missouri. *Southeastern Biology* 55 (3): 337. Poster Presentation.

*Crabtree, C.D., **H.W. Keller**, and J.S. Ely. 2008. Macrofungi and Myxomycetes Associated with Specific Community Types of Ha Ha Tonka State Park, Missouri. "Central Scholars Symposium 2008", April 7, 8. Two awards were given in the Graduate Student Division for outstanding poster presentations. Christopher D. Crabtree won first place for his poster.

*Kilgore, C.M., **H.W. Keller**, and J.S. Ely. 2008. Myxomycete Species Assemblages on Aerial Reproductive Structures of Vascular Plants. "Central Scholars Symposium 2008", April 7, 8. Courtney M. Kilgore won (honorable mention) for her graduate student poster.

*Crabtree, C.D., J.S. Ely, and **H.W. Keller**. 2008. Macrofungi and Myxomycetes Associated with Specific Community Types of Ha Ha Tonka State Park, Missouri. Missouri Natural Resources Conference. Poster presentation. Won special conference award as the outstanding poster presentation.

*Kilgore, C.M., **H.W. Keller**, and J.S. Ely. 2008. Myxomycetes Species Assemblages: Aerial Reproductive Structures on Living Vascular Plants. Poster presentation at Missouri Natural Resources Conference, Tan-Tara, January 30-February 1, 2008. Won honorable mention award for poster presentation.

*Kilgore, C.M. and **H.W. Keller**. 2007. Aerial Reproductive Structures of Vascular Plants as a Micro-Habitat for Myxomycetes. 2007. "Central Scholars Symposium 2007", April 2-4. Oral Platform Power Point Presentation.

Keller, H.W., *S.E. Everhart, *C.M. Kilgore, G.J. Carmack, and *A.R. Scarborough. 2007. Myxomycetes, the True Slime Molds of Kentucky: New Species and New Records, with Field and Laboratory Observations of Plasmodial Tracks on a Canine Skull. *Southeastern Biology* 54 (3): 275. Oral Power Point Presentation.

*Everhart, S.E., **H.W. Keller**, and J.S. Ely. 2007. Role of Bark Characteristics and Epiphyte Cover in the Abundance, Distribution, and Succession of Corticolous Myxomycetes (true slime molds). *Southeastern Biology* 54 (3): 312. Poster Presentation.

*Everhart, S.E., **H.W. Keller**, and J.S. Ely. 2007. Ecology of Canopy Myxomycetes (true slime molds) on Trees and Grapevines (*Vitis aestivalis* and *V. vulpina*). *Southeastern Biology* 54 (3): 275. Oral Power Point Presentation.

*Scarborough, A.R. and **H.W. Keller**. 2007. Species Assemblages of Tree Canopy Myxomycetes related to environmental pH and Experimental Laboratory Protocols. *Southeastern Biology* 54 (3): 227. Oral Power Point Presentation.

*Scarborough, A.R. and **H.W. Keller**. 2007. Species assemblages of tree canopy myxomycetes related to environmental bark pH. "Central Scholars Symposium 2007", April 2-4. Oral Platform Power Point Presentation.

*Crabtree, C.D., **H.W. Keller**, and J.S. Ely. 2007. Fungi and Myxomycete Species Assemblages among Natural Communities and Microhabitats at Ha Ha Tonka State Park, Missouri. *Southeastern Biology* 54 (3): 315. Poster Presentation.

*Crabtree, C.D., J.S. Ely, and **H.W. Keller**. 2007. Preliminary results of macrofungi and myxomycete species assemblages associated with selected terrestrial natural communities of Ha Ha Tonka State Park, Missouri. Natural Resources Conference, January 31-February 2, 2007. Poster Presentation.

*Crabtree, C.D., J.S. Ely, and **H.W. Keller**. 2007. Preliminary Results of Macrofungi and Myxomycete Species Assemblages Associated with Selected Terrestrial Natural Communities of Ha Ha Tonka State Park. The Best Graduate Poster Award at the Central Scholars Symposium, April 2-4, 2007.

*Everhart, S.E. and **H.W. Keller**. 2007. Species Assemblages and Distribution of Corticolous Myxomycetes on Trees and Grapevines in the Tree Canopy of Three Temperate Forest Communities. "Central Scholars Symposium 2007", April 2-4. Oral Platform Power Point Presentation.

*Everhart, S.E. (Advisors) **H.W. Keller** and J.S. Ely. 2007. Tree Canopy Myxomycetes (True Slime Molds): Distribution Patterns and Species Assemblages on Trees and Grapevines in Temperate Forests. Sigma Xi Program OR-05, page 64. (Power Point Oral Presentation). Sydney represented the UCM Sigma Xi Chapter at the Sigma Xi Annual Meeting and Student Research Conference held at Orlando, Florida, November 1-4, 2007.

*Everhart, S.E., **H.W. Keller**, J.S. Ely, and S.W. Wilson. 2006. Slime, Skulls, and the Giant Grapevine: Ecology of Canopy Myxomycetes (true slime molds) on Tree and Grapevines (*Vitis aestivalis* and *V. vulpina*) Sigma Xi Annual Meeting and Student Research Conference. Program of Events. (Program Update Addendum) EB-14. Page 12.

*Scarborough, A.R. and **H.W. Keller**. 2006. Tree Canopy Myxomycetes (True Slime Molds): Species Assemblages and Diversity in Relation to Bark pH. *Transactions of the Missouri Academy of Science, Collegiate Division*, 40: 104-105. Oral Power Point Presentation.

*Scarborough, A.R. and **H.W. Keller**. 2006. Vertical Distribution Patterns of Tree Canopy Myxomycetes in Great Smoky Mountains National Park and Pertle Springs. *Transactions of the Missouri Academy of Science, Collegiate Division*, 40: 105. Poster Presentation.

*Everhart, S.E. and **H.W. Keller**. 2006. Ecology of Canopy Myxomycetes on Grapevines. *Transactions of the Missouri Academy of Science, Senior Division*, 40: 87. Oral Power Point Presentation.

*Fanning, E.F., J.S. Ely, **H.W. Keller**, and H.T. Lumbsch. 2006. Great Smoky Mountains National Park: Vertical Distribution of Lichen Growth Forms in Canopies of Selected Tree Species. *Transactions of the Missouri Academy of Science, Senior Division*, 40: 87-88. Oral Power Point Presentation.

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*Scarborough, A.R. 2006. Species Assemblages of Tree Canopy Myxomycetes Related to Bark pH. *Southeastern Biology* 53 (2): 79-80. Oral Power Point Presentation.

*Scarborough, A.R. 2006. Tree Canopy Myxomycetes: Patterns of Distribution. *Southeastern Biology* 53 (2): 299-300. Poster Presentation.

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- *Scarborough, A.R. and **H.W. Keller**. 2006. Tree Canopy Myxomycetes (True Slime Molds): Species Assemblages and Diversity in Relation to Bark pH. Transactions of the Missouri Academy of Science, Collegiate Division, Vol.40: 104-05. Oral Platform Power Point Presentation.
- *Scarborough, A.R. and **H.W. Keller**, Department of Biology, Central Missouri State University, Vertical Distribution Patterns of Tree Canopy Myxomycetes in Great Smoky Mountains National Park and Pertle Springs. Transactions of the Missouri Academy of Science, Collegiate Division, Vol. 40: 105. Poster Presentation.
- *Everhart, S.E. and **H.W. Keller**. 2006. Ecology of Canopy Myxomycetes on Grapevines. Transactions of the Missouri Academy of Science, Senior Division, Vol. 40: 87.
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- *Scarborough, A.R. 2006. Species assemblages of tree canopy myxomycetes related to bark pH. Southeastern Biology 53 (2): 79-80.
- *Scarborough, A.R. 2006. Tree Canopy myxomycetes: patterns of distribution. Southeastern Biology 53 (2): 299-300.
- *Scarborough, A.R. 2005. Ecological Distribution of Tree Canopy Myxomycetes Sampled from Great Smoky Mountains National Park and Pertle Springs, Johnson, County, Missouri. McNair Journal, Fall, Page 27. Front cover color photograph Caption: McNair Scholar Angela Scarborough measures pH values of moist chamber bark cultures and scans bark for rare or new species of myxomycetes.
- *Scarborough, A.R. and **H.W. Keller** 2005. Ecological Distribution of Tree Canopy Myxomycetes Sampled from Great Smoky Mountains National Park and Pertle Springs, Johnson, County, Missouri. 9th Annual Ronald E. McNair, Heartland Research Conference, Kansas City, Missouri, September 23-25, 2005. Oral Power Point Platform Presentation. In published Abstracts # 64. Angela also presented a poster entitled "Tree Canopy Myxomycetes".
- Gaither, T.W. and **H.W. Keller**. 2005. Another Gasteromycete with Myxomycetous Characteristics. 5th International Congress on Systematics and Ecology of Myxomycetes. (ICSEM5). Tlaxcala, Mexico, August 8-13, Universidad Autonoma de Tlaxcala. P. 33. (Poster Presentation)
- Keller, H.W.** 2005. Tree Canopy Myxomycetes in Great Smoky Mountains National Park and in Big Oak Tree State Park, U.S.A. 5th International Congress on Systematics and Ecology of Myxomycetes. (ICSEM5). Tlaxcala, Mexico, August 8-13, Universidad Autonoma de Tlaxcala. P. 43-44. (Oral Platform Presentation). Special Oral Session, Canopy Tree Myxomycetes, Coordinator and also served on the Scientific Committee for the Congress.
- Keller, H.W.** 2005. What is a Myxomycete Species. 5th International Congress on Systematics and Ecology of Myxomycetes. (ICSEM5). Tlaxcala, Mexico, August 8-13, Universidad Autonoma de Tlaxcala. P. 45-46.
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*Parker, E. E. and **H.W. Keller**. 2004. Correlation of pH with Assemblages of Corticolous Myxomycetes. *Transactions of the Missouri Academy of Science, Collegiate Division*, Vol. 38: 73. (Oral Platform Presentation).

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Keller, H.W., and H.C. Aldrich. 1972. Scanning electron microscopy and freeze-etching of fructifications (peridia, capillitia and spores) of certain slime molds species. ASB Bulletin. 21(2): 64.

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Theses

Keller, H.W. 1963. A comparative anatomical study of the genus *Echinacea*. Master's Thesis, University of Kansas, Lawrence. 97 p., 90 Figs., Professor R. L. McGregor, Major Advisor.

Keller, H.W. 1971. The genus *Perichaena* (Myxomycetes): a taxonomic and cultural study. Ph.D. Dissertation, University of Iowa, Iowa city, 199 p. Professor George W. Martin, Major Advisor.

Graduate Student Master's Thesis – Harold W. Keller, Thesis Chairman

*Snell, K.L. 2002. "Vertical Distribution and Assemblages of Corticolous Myxomycetes on Five Tree Species in the Great Smoky Mountains National Park", Department of Biology, Central Missouri State University. 47 p. revised and published in *Mycologia* and *Castanea*.

*Everhart S.E. 2007. "Assemblages and distribution of corticolous myxomycete species in the tree canopy of selected forests in Kentucky and Tennessee" [Master's Thesis]. Department of Biology and Earth Science, University of Central Missouri. 75 p. Revised and published in *Mycologia*, *Fungal Diversity*, and *Botany*.

*Crabtree, C.D. 2008. Masters thesis "Macrofungi and myxomycetes of selected terrestrial natural communities of Ha Ha Tonka State Park (completed May, 2008) Department of Biology and Earth Science, University of Central Missouri published in *Mycologia*.

*Kilgore, C.M. 2008. Masters thesis "Aerial reproductive structures of vascular plants as a microhabitat for myxomycetes." Department of Biology, University of Central Missouri (completed May, 2008) Department of Biology and Earth Science published in part in *Mycologia* and *Inoculum*.

External Thesis Examiner

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Book review leader for BRIT Book Review Club

2021. A Sand County Almanac, and Sketches Here and There, by Aldo Leopold.

2020. The Lochsa Story: Land Ethics in the Bitterroot Mountains, by Bud Moore;

2020. A River Runs Through It and Other Stories. 1976. The other stories: "Logging and Pimping and "Your Pal Jim"; USFS,: The Ranger the Cook, and a Hole in the Sky"

2019. Becoming Native to this Place by Wes Jackson.

Book Reviews (64 here)

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- Keller, H.W. 1995. Morel, A Lifetime Pursuit, by V. V. "Tommy" Thompson, Missouri Mycological Society, *Mycophile*, September/October, 1995
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- Keller, H. W. 2009. Rare Wildflowers of Kentucky. by T. G. Barnes, D. White, and M. Evans. *Journal of the Botanical Research Institute of Texas* 3 (1): 168.
- Keller, H. W. 2009. Cacti, Agaves, and Yuccas of California and Nevada. by Stephen Ingram. *J. Bot. Inst. Texas* 3 (1): 12
- Keller, H. W. 2009. The Biology of Cellular Slime Molds. by J. T. Bonner. *Journal of the Botanical Institute of Texas* 3 (2): 168.
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- Keller, H. W. 2010. Common Interior Alaska Cryptogams, Fungi, Lichenicolous Fungi, Lichenized Fungi, Slime Molds, Mosses, and Liverworts. by Gary A. Laursen and Rodney D. Seppelt. *Journal of the Botanical Research Institute of Texas* 4 (1): 434.
- Keller, H.W. 2011. Les Myxomycetes: Guide to Identification. *Journal of the Botanical Research Institute of Texas* 5 (1): 138.
- Keller, H. W. 2011. WILDLANDS PHILANTHROPY: The Great American Tradition. *Journal of the Botanical Research Institute of Texas* 5 (1): 142.

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- Keller, H. W. 2011. The Macrolichens of New England. Journal of the Botanical Research Institute of Texas 5 (2): 632, 634.
- Keller, H. W. 2011. Liverworts of New England: A Guide for the Amateur Naturalist. J. Bot. Res. Inst. Texas 5 (2): 836.
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- Keller, H. W. 2017. *Echinacea*: Herbal Medicine with a Wild History. J. Bot. Res. Inst. Texas 11(2): 408, 412, 418.
- Keller, H.W. 2021. Appalachian Mushrooms: a field guide. J. Bot. Res. Texas. 15 (1): 316.
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- Keller, H.W. 2021. Hogs Are Up: Stories of the Land, with Digressions. J. Bot. Res. Texas 15(1): 72.
- Keller, H.W. 2021. The Restless and Relentless Mind of Wes Jackson, Searching for Sustainability. J. Bot. Res. Texas 15 (1); 120

Workshops and Forays

- 1969 Participant in the Mycological Society of America (MSA) Annual Foray held at the University of Michigan Biological Field Station, Douglas Lake, September 9-13.
- 1970 Participant in the MSA Annual Foray held at University of Indiana, Bloomington, August 22-23, contributed identified myxomycete specimens for the foray list of species published in Mycologia.
- 1973 Participant in the MSA Annual Foray held at the University of Massachusetts, Amherst, June 16-17. contributed and identified myxomycete specimens for the foray list of species.
- 1974 Participant in a workshop devoted to the study and identification of the Fungi Imperfecti held at the University of Northern Arizona, Flagstaff, June 12-16.
- 1974 Field trip leader for Ohio Mushroom Society at Ohio State University Barneby Center for Environmental Education near Rock Bridge, in the Hocking Hills, October 13.
- 1975 Foray leader at the Ohio Mushroom Society Annual Foray held at John Bryan State Park near Yellow Springs, Ohio October 4-5.
- 1976 Ecology lecturer and naturalist trail guide through our forest nature preserve for the SPEDY Program (Summer Program for Economically Deprived Youth).

- 1977 Foray and trail leader for the North American Mycological Association (NAMA) Annual Foray held at Concord College, Athens, West Virginia, July 21-24.
- 1978 Foray leader for the Plant Sciences Section of the Ohio Academy of Science held at the Glen Helen Nature Preserve of Antioch College.
- 1978 "Stalking the Wild Mushroom" Mushroom Workshop Leader held at The Land Institute, Wes and Dana Jackson, Co-directors, Salina, Kansas. A two-day workshop featuring lectures, slide shows, field forays, and the collection and identification of edible and poisonous mushrooms.
- 1978 Participant in the MSA workshop on "Lower Fungi" held at the University of Georgia, Athens, August 17-19. Participant in the MSA Annual foray, August 25, contributed identified specimens to the foray list of species published in Mycologia.
- 1978 Speaker and Workshop Leader - Mini-Workshops for Teaching Biology, "The Use of Fungi in Teaching Biology" Ohio College Biology Teachers Conference.
- 1979 "Truffles to Toadstools" Mushroom Workshop Leader, held at the Cincinnati Nature Center, Cincinnati, Ohio. An all-day workshop featuring lectures, slide shows, panel discussions, field forays, and the collection and identification of edible and poisonous mushrooms.
- 1979 Invited lecturer and foray leader for volunteer staff session entitled "Lower Plants" held at the Cincinnati Nature Center.
- 1979 Invited speaker, Miron Elisha Hard Foray, North American Mycological Association national foray held at Camp Muskingum, Ohio. Talk entitled "The Myxomycetes".
- 1980 Guest speaker, "Mushrooms - the Gourmet's Delight" and Foray Trail Leader during the conference, National Science Foundation -- Summer Leadership Conference held at the Pocono Environmental Education Center, Dingmans's Ferry, PA, August 10-15.
- 1980 "The Wonderful World of Fungi" held at the Aullwood Audubon Center, Dayton, Ohio, September 6, 1980.
- 1980 Foray Leader at the John N. Couch Foray, North American Mycological Association National Foray, at Camp Green Cove, Tuxedo, North Carolina.
- 1981 Leader of Mushroom Workshop entitled "Mushrooms of Ohio" held at the Cincinnati Nature Center.
- 1981 Participant in the MSA Annual Foray held at the University of Indiana, contributed identified myxomycete specimens to the foray list of species published in Mycologia.
- 1984 Guest mycologist, speaker, foray, and workshop leader at the Texas Mycological Society Eighth Annual Texas Mushroom Foray, September 14-16, Big Thicket, Lumberton.
- 1984 MSA Annual Foray held at Colorado State University, Fort Collins, contributed specimens to the foray list of species published in Mycologia.
- 1985 MSA Annual Foray in the environs of the University of Florida, Gainesville, contributed identified myxomycete specimens to the foray list of species published in Mycologia.
- 1990 MSA Annual Foray in the environs of the University of Wisconsin - Madison, contributed identified myxomycete specimens to the foray list of species published in Mycologia.
- 1991 Organizer and Presenter, "Myxomycete Workshop" at the Annual Meeting of American Institute of Biological Sciences/Mycological Society of America (AIBS - MSA), San Antonio, Texas, August 4 at Southwest Texas State University, San Marcos.
- 1992 Organizer and Presenter, Short Course entitled "Medicine and Science Education K-12", offered by the Texas Biomedical Research Society at the joint National Science Teachers Association -Conference for the Advancement of Science Teaching, 92 Convention, October 15, UNTHSC, Fort Worth, Texas.
- 1992 Botanical Research Institute of Texas video entitled "Light Diminishing Darkness" where I portray a scientist.
- 1993 The Ladies of the Fort Worth Garden Club, Co-Sponsored by the The Fort Worth Botanic Garden and Fort Worth Park and Recreation Department present "Love in Bloom" the 66th Annual Flower Show and Garden Festival - Special Exhibit, THE PHYSICK GARDEN OF MEDICINAL PLANTS, Coordinator and consultant to the Botanical Research Institute of Texas and UNTHSC.
- 1993 Foray Captain, MSA Annual Foray to the Chattahoochee National Forest, in north Georgia.

- 1995 Workshop organizer and leader, "The Wonderful World of Myxomycetes", August 24, 25, 1995, North American Mycological Association (NAMA) Mary S. Whetstone Foray, Bemidji, Minnesota.
- 1995 Facilitator - instructor for workshops annually, Project Learning Tree (PLT), award-winning environmental education program designed for teachers working with students K-12, sponsored by the Texas Forestry Association and Living Science Center.
- 1996 Foray Captain, APS - MSA Annual Meeting Foray, Yellowwood State Park and Hoosier National Forest, Indiana.
- 1996 Foray Leader and invited speaker for the Missouri state foray at Mingo National Wildlife Area "The Wonderful World of Myxomycetes".
- 1997 Invited speaker, workshop organizer and leader, "The Wonderful World of Myxomycetes: Collection and Identification", August 14 - August 17, 1997, at Copper Mountain Resort, Colorado, North American Mycological Association (NAMA) national foray, foray captain for Myxomycetes.
- 1998 Invited speaker, workshop and foray leader "The Myxomycetes (Small is Beautiful!): How to Collect and Identify the Biological Jewels of Nature", April 18, 19, The New Mexico Mycological Society, Albuquerque, New Mexico.
- 1999 Workshop leader with Thomas W. Gaither, "Myxomycete Systematics Workshop" Third International Congress on the Systematics and Ecology of Myxomycetes", July 26-30, Beltsville, Maryland, United States of America.
- 2004 Foray Captain (Myxomycetes) , MSA Annual Meeting Foray, University of North Carolina Asheville, NC., July 17, Bent Creek Experimental Forest, Pisgah National Forest.
2005. Course 1: Workshop Leader with Thomas W, Gaither. Taxonomy of Myxomycetes. 5th International Congress on Systematics and Ecology of Myxomycetes. (ICSEM5). Tlaxcala, Mexico, August 8-13, Universidad Autonoma de Tlaxcala.(Myxomycete All-day Workshop with oral power point presentation).
- 2007 Foray Captain (Myxomycetes), MSA Annual Meeting Foray, 75th Anniversary, Louisiana State University, August 5, 2007, Quida Plantation and West Feliciana Sports Park in West Feliciana Parish, near St. Francisville.
- 2008 Foray Captain (Myxomycetes), MSA Annual Meeting Foray, Pennsylvania State University, August 10, Lock Haven Conference Center.
- 2009 Foray Captain (Myxomycetes). MSA Annual Meeting Foray, Snowbird, Utah, July 25, Uinta Mountains.
- 2010 Coordinator, MSA Annual Meeting Foray, Bernheim Arboretum and Research Forest, Kentucky, June 27.
- 2011 Workshop Leader, Myxomycetes Workshop: educational materials, teaching, and research with Myxomycetes. Pre-congress mini-courses. VII International Congress on Systematics and Ecology of Myxomycetes.
- 2011 Course entitled " Cryptogamic Tree Canopy Biodiversity" for master's and doctorate students. Pre-congress mini-course VII International Congress on Systematics and Ecology of Myxomycetes.
- 2011 Myxomycete Workshop "The Wonderful World of Myxomycetes" presented at Rutgers University, October 29 for the New Jersey Mycological Association.
- 2013 Foray Coordinator, MSA Annual Meeting Foray with the American Phytopathological Society, University of Texas, Austin, August 10-14.

Invited Talks and Seminar Presentations

- 1971 "The genus *Perichaena* (Myxomycetes): A Taxonomic and Cultural Study" Department of Botany Seminar Series, The University of Iowa, Iowa City.
- 1971 "The Genus *Perichaena*" The professional and scientific staff of the National Fungus Collections, Beltsville, MD
- 1972 "Poisonous and Edible Fungi of Florida" Department of Plant Pathology Seminar Series, University of Florida.
- 1972 "Edible Fungi: A Gourmet's Delight" The Society of Sigma Xi Seminar Series, Wright State University.
- 1973 "What Are Slime Molds?" Fairborn Central Junior High School, Fairborn, Ohio.
- 1973 "Poisonous and Edible Fungi" The Biological and Health Sciences Club, Wright State University.
- 1974 "The Myxomycetes - Plasmodial Slime Molds" Ohio Mushroom Society, Barneby Center, Rock Bridge, Ohio.

- 1975 "Poisonous and Edible Fungi of Ohio" Glen Helen Association Community Outdoor Lecture Series, Yellow Springs, Ohio.
- 1976 "Corticolous Myxomycetes: Slime Molds in Treetops" Department of Biological Sciences Seminar Series, Wright State University, Dayton, Ohio.
- 1976 "Poisonous and Edible Fungi of Ohio" Biology Class, Park Hills High School, Fairborn, Ohio.
- 1976 "Poisonous and Edible Fungi of Ohio" University of Dayton Biology Club, Dayton.
- 1976 "Poisonous and Edible Fungi of Ohio" The Xenia Rotary Club, Xenia, Ohio.
- 1976 "Slime Molds in Treetops" Department of Microbiology and Immunology Seminar Series, Wright State University, Dayton, Ohio.
- 1977 "Poisonous and Edible Fungi of Ohio" Glen Helen Association, Antioch, Community Outdoor Lecture Series, Yellow Springs, Ohio
- 1977 "Slime Molds in Treetops" University of Dayton Visiting Speakers Series, Dayton, Ohio.
- 1978 "Poisonous and Edible Fungi of Ohio" Invited guest speaker for student assembly, Vandalia-Butler High School, Vandalia, Ohio.
- 1979 "Stalking the Wild Mushroom" Glen Helen Association, Community Outdoor Lecture Series, Yellow Springs, Ohio.
- 1980 "Taxonomic Puzzles in the Myxomycetes" Invited seminar speaker, Department of Botany, Ohio University, Athens, Ohio.
- 1980 "Classification in Biology" Ohio Academy of Science Visiting Scientists Program, lecturer for all biology classes, Springfield North High School, Springfield, Ohio.
- 1980 "Taxonomic Puzzles in the Myxomycetes" Invited seminar speaker, Department of Botany, Southern Illinois University, Carbondale, Illinois.
- 1981 "The Poisonous and Edible Mushrooms of Ohio" Invited speaker, Wild Flower Preservation Society, University of Cincinnati, Cincinnati, Ohio.
- 1986 "The Fascination of the Slime Molds" Invited speaker, the 10th Annual Texas Mushroom Foray, Big Thicket, Lumberton, Texas.
- 1987 "Taxonomic Puzzles in the Myxomycetes" Seminar speaker, Department of Biology, University of Texas at Arlington (UTA).
- 1988 "Edible Mushrooms, The Gourmet's Delight - Poisonous Toadstools, A Deadly Bite" Botanical Society, UTA.
- 1995 "The Wonderful World of Fungi" presented to the naturalists and staff at River Legacy Parks" Arlington, TX.
- 1996 Presentation and distribution to congress attendees the information gathered for the "World Directory of Myxomycologists" Second International Congress on the Systematics and Ecology of Myxomycetes (ICSEM2), organized by Real Jardín Botánico, CSIC, Madrid, Spain.
- 1996 Plenary Address, Invited Speaker, "Biosystematics of Myxomycetes: A Futuristic View", Second International Congress on the Systematics and Ecology of Myxomycetes (ICSEM2), organized by Real Jardín Botánico, CSIC, Madrid, Spain, extended invitation on behalf of United States of America delegation to meet at the National Fungus Collections (BPI), Beltsville, Maryland in 1999.
- 1997 "Fascinating Fungi of River Legacy Parks", Regional Meeting of Nature Interpreters, Stephen F. Austin State University, Nacogdoches, Texas.
- 1998 Edible Mushrooms, The Gourmet's Delight - Poisonous Toadstools, A Deadly Bite" Central Missouri State University, evening public lecture series.
- 1999 "Wonderful World of Myxomycetes: The Biological Jewels of Nature" Kaw Valley Mycological Society, featured speaker, Lawrence, Kansas.
- 2000 "Student Research Experiences in the Great Smoky Mountains National Park" Central Missouri State University Seminar Series.

- 2009 "Evaluation of Myxomycetes in Fossil Amber-A Myxomycologist's Perspective" North American Mycological Society, Lafayette, Louisiana, NAMA/GSMS 2009 Foray, Foray Captain for Myxomycetes. Invited Speaker.
- 2011 "Myxomycete Biosystematics: Past, Present, and Future" Invited Keynote Address Seventh International Congress on the Systematics and Ecology of Myxomycetes. September 10-17, 2011, Recife, Brazil and organizer and leader of a Round Table Discussion entitled "Myxomycete Habitats" and Power Point Presentations: "Myxomycete Habitats: an overview" and "Corticulous Myxomycetes" and participant in another Round Table Discussion "Generic Delimitations in the Myxomycetes: the Trichiales"
- 2011 "Musings of a Myxomycologist" invited to deliver the first Sang Park Memorial Lecture to the New Jersey Mycological Association established to honor Dr. Sang Park and his study of Myxomycetes. October, 2011. (snow storm cancellation).
- 2013 "The Wonderful World of Myxomycetes" invited speaker for the Wisconsin Mycological Society, May 7, Milwaukee.

Professional Service

Graduate, Medical Field Service School, Brooke Army Medical Center, Medical Service Corps Officer Orientation Course, Fort Sam Houston, San Antonio, Texas, 1964; Military Service, Captain, United States Army Medical Service Corps, Third United States Army Medical Laboratory, Fort McPherson, Atlanta, Georgia, Officer in charge of Medical Parasitology Branch and Medical Illustration Branch; Adjutant to Commanding Officer and Officer in charge of Administrative Branch and Student Detachment; additional duties - Charity Key Man for unit (United Way), Library Officer, Custodian and Destruction Officer for classified documents (1964-67).

Member of the Editorial Board of The North American Mycological Association that publishes the journal *McIlvainea* and Editor of the *Mycophile* (1975-86; 1993-1997).

Sustaining Membership Committee of The Mycological Society of America (1973-76; re-appointed 1976-79; chairman, 1980-83).

Panel member for an Evening Discussion I: Federal Funding for Mycological Research, "What to Expect of your Sponsored Projects Office" presented at the Mycological Society of America Annual Meeting, June 24-28, 1990 held at the University of Wisconsin-Madison. Also with a NSF Program Officer, representative from the Canadian Research Council, that involved a question and answer session following presentations.

Awards Committee, Mycological Society of America; judge for Distinguished Mycologist Award, Alexopoulos Research Prize, Graduate Student Fellowships, Best Student Paper presented at annual meeting (1980-83)

Mycologia Memoirs, Board of Editors, ex officio (1980-83).

Reviewer of grant proposals to the National Science Foundation (national panels (4) and individual proposals), Department of Education (national panels (6) and individual proposals), Environmental Protection Agency, American Association for the Advancement of Science (1972-to present), and other international agencies.

Reviewer of more than 100 papers submitted to 15 different scientific journals. (1972 to present)

Member Human Use Research Committee (HURC), Wright Patterson Air Force Base (1979-82).

Institutional (Wright State University) Representative to the Advisory Board of The Ohio Biological Survey (1975-78).

Appointed by James B. Hunt Jr., Governor, State of North Carolina, as a member of the Marine Resources Center Administrative Board, Appointment term (1982-83).

University representative to the University Council on Research, The University of North Carolina, General Administration, (1982-83).

University representative, Appropriate Technology Consortium of North Carolina, (1982-83)

Chairman, Planning Team for the Southeastern North Carolina Regional Forum on Science and Technology, (May 24, 1983).

Finance Committee of the Mycological Society of America, (1984-1990).

The Association for Higher Education of North Texas, Research Administration Committee, Chairman Visiting Sponsor Programs (1984-90)

Judge, best undergraduate and graduate student paper, AAAS/SWARM meeting, March, 1988, Wichita, Kansas.

1992 to 2001 Kansas Wesleyan University Board of Trustees, Chairman, Academic Affairs, Member, Institutional Advancement Committees, Chairman Futuring Conference, Program Scope and Specialties, Strategic Five-Year Plan, New Library Building Task Force

Texas Society for Biomedical Research, Leadership Education Committee, Hotline advisor for school children and teachers K-12, 1991 to 1998.

Editor Mycophile, newsletter for the North American Mycological Association, an organization of approximately 2,000 mostly amateur members interested in fungi (mushrooms), 1993-1997, Contributing Editor, 1997 to 1998.

River Legacy Foundation Education Committee plans and oversees Living Science Center activities, trains, recruits and coordinates volunteers, guides public groups on nature trails, 1994 - 1998.

Steering Committee Member, for the World Health Forum, co-sponsored by the International Hospital Federation and the City of Fort Worth, April 28 to May 3, 1996, "Health Professionals - The New Breed" and February 22-27, 1998, "The Delicate Balance of World Health - Emerging Plagues and Resurrected Pestilence".

ACT-SO, acronym for Afro-Academic Cultural, Technological and Scientific Olympics, consultant - advisor, for "Olympics of the Mind" targeting African American students in grades 9-12, O.D. Wyatt High School, Fort Worth ISD, 1996 to 1998.

Co-Chair of Judging for the 49th Intel International Science and Engineering Fair held May 10-16, 1998 at Fort Worth, Texas.

Inaugural Lecture (Invited Plenary Address): Second International Congress on Systematics and Ecology of Myxomycetes, "Biosystematics of Myxomycetes: A Futuristic View", April 15 - April 19, 1996, Real Jardin Botanico, CSIC, Madrid, Spain.

Member of the Organizing Committee, Third International Congress on Systematics and Ecology of Myxomycetes, Beltsville, Maryland, July 26-30, 1999.

Appointed by Program Officer of Biodiversity Surveys and Inventories Program, Division of Environmental Biology, National Science Foundation to moderate session and prepare the final 10-year report at a meeting of current NSF grantees on "How to Increase Participation of Undergraduates in NSF Programs" held at Orcas Island, Washington, May, 2000.

Member of the Scientific Committee, Fourth International Congress on Systematics and Ecology of Myxomycetes, Meise, National Botanic Garden of Belgium, August 4 - 9, 2002.

Member of the Scientific Committee, Fifth International Congress on Systematics and Ecology of Myxomycetes, Tlaxcala, Mexico, Universidad Autonoma de Tlaxcala, August 8-13, 2005.

Member of the Scientific Committee, Sixth International Congress on Systematics and Ecology of Myxomycetes, Yalta, Crimea, Ukraine, October 4-11, 2008.

Member and Chairman of the Ecology Committee, Mycological Society of America, 2008-2012.

Appointed as Editorial Board Member and Contributing Editor for the new journal FUNGI, 2008 to present.

Participant in a NSF-sponsored workshop on Systematics Research at Primarily Undergraduate Institutions (PUIs) held June 13-17, 2010 at Boise State University, Boise, Idaho with article published in *Inoculum* 61 (4): 36-37.

Member of the Scientific Committee, Seventh International Congress on Systematics and Ecology of Myxomycetes, Recife, Brazil, September 10 – 17, 2011.

Member of the BRIT Research Advisory Committee that oversees, promotes, and evaluates research, 2011- to present.

Member of the BRIT Press and JBRIT Editorial Board that reviews and evaluates Press activities, 2012- to present.

Member of the Scientific Committee, Eighth International Congress on Systematics and Ecology of Myxomycetes, held in Changchun, China (People's Government of Jilin Province), August 12 – 15, 2014.

University Service at Wright State University, University of Texas at Arlington, and University of North Texas Health Science Center

Institutional Biosafety Committee Member (1980-82)

Medical Human Subjects Review Committee, Member, Administrative Coordinator, and Chairman (1978-82)

Research Committee of Wright State School of Medicine, Member (1978-82)

Chairman Committee on Protection of Human Subjects, (1982-83)

Chancellor's Ad Hoc Advisory Committee on Computer and Information Systems (1982-83)

University Research Committee, Member, (1982-83)

Organized Research Fund University Committee (1983-90)

Administrative Council (1983-90); Human Research Review Committee (1983-90)

Animal Care and Facilities Committee (1983-90)

Institutional Self-Study/Externally Funded Grants and Contracts Committee (1984-85)

Search Committee Member, Director of Libraries (1984); participated in search for Dean of Engineering and Dean of Graduate School of Social Work

Intellectual Property Committee (1987-1990)

Research Advisory Committee to Chancellor Hans Mark, University of Texas System (1985-88)

Institutional Self Study - Educational Program Committee/Faculty Committee to review the mission, role and scope for UNTHSC-FW for addition of School of Graduate Biomedical Sciences, School of Public Health, and School of Allied Health for accreditation by the Southern Association of Colleges and Schools; Institutional Effectiveness Committee - assessment and performance measures (1992-1998)

Prepared and designed a two-credit hour course for graduate students at UNTHSC-FW entitled **“Introduction to Industry Practice”** in cooperation with the City of Fort Worth's Strategy 2000. This course was designed to help graduate students prepare for industry positions and broaden their career path horizons. Industry leaders and CEOs from Fort Worth volunteered their time to present lectures on industry organization, regulatory and environmental topics, research and development, quality control, marketing and sales, budgeting, clinical studies, intellectual property, entrepreneurial development, and career planning.

Admissions interviewer for student doctor applicants to the UNTHSC-FW medical school (1993-1998)

UNTHSC Research Appreciation Day, in charge of judging best poster and oral presentation and raising funds for awards ceremony (1993-1998)

Chairman, UNTHSC Institutional Biosafety Committee (1994-1998)

Appointed by president and elected chair of Conflict of Interest Committee (1996-1999)

Administrative responsibility for Federal and State Policies/Reports; IRB; Intellectual Property; Scientific Integrity; Conflict of Interest; Institutional Biosafety; Radiation Safety; Laboratory Animal Medicine; Employee Orientation Task Force Member, preparation of "Employee Orientation Handbook" (1997-1998); Faculty Orientation Sessions: Pre-award and post-award procedures at UNTHSC; cyber-funding opportunities, Human Subjects Review Committee (1998-2002)

College Service

Graduate Studies Committee, Member, College of Science and Engineering (1974-78)

Graduate Study Program, Director, Masters Degree Program in Sciences (1974-78)

Biological Sciences Phase I New Building Committee (1972-74)

Departmental Service

Recruitment Committees, Chair, Botanist Search Committee; Member, Microbiologist Search Committee; screening committees for six new faculty positions, including a new chairman (1972-78)

Sponsor of the Biological and Health Sciences Club (1975-78)

Coordinator for the Department, Graduate Student Research and Honors Student Seminars (1974-76)

Biology Preserve Committee (1972-78); Capital Equipment Committee (1972-76)

Undergraduate Core Curriculum Committee (1974-76)

Academic Advisor for Medical Technology and Biology majors (1972-78)

Organized Research Fund Committee, UTA Department of Biology (1983-90)

Proposal Review Committee, UTA, Phi Sigma Society, Biology Honor Society (1983-90)

Research Committee Chairman, Doctoral Degree Program in Quantitative Biology, approved by the Texas Higher Education Coordinating Board (1988-89)

Community Service

Volunteer Water Safety Instructor for American Red Cross, Swimming Program (1960-67)

Assistant Scoutmaster of Troop #237, Merit Badge Counselor, Fort McPherson, (1964-66)

Charity Key Man United Way Campaign, Fort McPherson, Atlanta, Georgia, (1964-1967)

Consultant on mushroom poisonings, Dayton, Ohio and Arlington, Texas area hospitals, (1972 to 1990)

Wright State Speakers Bureau, talks given to local garden and mushroom clubs (1972-82)

Plant biology judge, biology judge at the Southwestern Ohio District Science Day Fairs and Fairborn Science Day Fairs; judge for the best undergraduate and graduate student paper in the plant sciences at the Annual Meeting of the Ohio Academy of Science (1973-82)

Chief, Y-Indian Guides Tribe, (1976)

Manager and Coach, Fairborn Little League Baseball Team, (1977)

University Steering Committee, United Way Campaign, (1982)

Volunteer Soccer Referee, Soccer Association for Youth (1978-81)

Vice-President, American League, Fairborn Little League Baseball; Coordinator for Junior Minors Program, (1978)

Manager, slow-pitch softball team, First United Presbyterian Church, 1979

Troop Committee Chairman, Boy Scout Troop #72, Fairborn, Ohio, (1981-82)

Kiwanis Club of Arlington volunteer cook for Pancake Day money raising event (1985-87)

Judge, Fort Worth Regional Science Fairs, Chair, Botany, Microbiology and Best of Fair Judge (1985 -1998, 2015)

Head of Botany Judging (recruitment and organization of judging teams) Best of Division, 37th International Science and Engineering Fair, Fort Worth, Texas May 11-17, 1986

Member, Board of Consultants, North Texas Poison Center at Parkland Memorial Hospital, Dallas, on call for mushroom poisonings at area hospitals (1986 - 1998)

Participant in fund raising events as a jogger; American Heart Association 10 K runs (1990 -1996)

Volunteer Naturalist and trail guide for community groups and general public on Saturdays at River Legacy Parks- Living Science Center. (1990-1998)

University of North Texas Health Science Center (scientist-community member) of the Institutional Biosafety Committee, 2012 - 2013.

University of North Texas Health Science Center (scientist-community member) of the Institutional Animal Care and Use Committee, 2012-2013.

Botanical Research Institute of Texas, Committee Member, search for Research Botanists, Sula Vanderplank and Dwayne Estes, 2016.

Botanical Research Institute of Texas, Committee Member, search for Applied Research Position, Karen Hall, 2017.

BRIT associated since early 1990s as Research Associate and Resident Research Associate.

BRIT Editorial Board 2014 to present and FUNGI Editorial Board 2008 to present.