

Bio:Life

BGSU | COLLEGE OF ARTS & Sciences
BOWLING GREEN STATE UNIVERSITY

DEPARTMENT OF BIOLOGICAL SCIENCES ALUMNI NEWSLETTER

Chair's message

Hello, Alumni! What a fabulous fall we have had here in northwest Ohio. The weather was great (notice the past tense, as we are expecting snow tomorrow!) and we have been active on numerous fronts in Biological Sciences.

We added a Forensic Biology specialization to our undergraduate program and we are in the process of adding a BA program to give our biology majors an opportunity for added breadth in their program, like business courses that they can use when they graduate.

The Forensic Biology specialization complements our new relationship with the Ohio Bureau of Criminal Investigations lab that was built this year just north of the Life Sciences Building. Students in the specialization take the foundation courses you all took, but then they also take courses in criminal justice and a new lab course in forensics and molecular biology techniques to give students the DNA laboratory skills they need in criminal investigation labs. We already have more than 20 students in the specialization! In fact, two of our upperclassmen met with President Mazey and heard remarks of the Ohio Attorney General, Mike DeWine, at the grand opening of the BCI building on November 10.

Next step? A new MS program in Forensic Sciences at BGSU will promote advanced research in criminalistics by students and faculty, as well as engage BCI employees to interact with us through internships, participation in courses, and research directions.

We have 702 undergraduate majors this fall along with 80 graduate students in Biology. The Dean of the College of Arts and Sciences has asked departments to indicate how we can grow our programs through retention and recruitment. Faculty have stepped up and increased new engaged teaching pedagogies in the classroom—less lecturing and more direct involvement with the student's learning process.

We are also working directly with prospective students. Our goal is to increase the biology major population by 10% in four years. This is realistic, but we need your help. First - please talk with your friends and neighbors about your experiences at BGSU and encourage young people to look into BGSU; if biology is their interest, have them contact me directly at jminer@bgsu.edu. Second - you know that the costs of college education are going up and that scholarships greatly encourage students to come and stay at BGSU; please look at our scholarships in this newsletter and make a substantive end-of-year contribution.

Interested in retaining the best faculty? Think about an endowed professorship. All of the contributions go directly to students or to activities of direct value to students and faculty participation with students.

Thanks for your support of BGSU Biological Sciences. It is very much appreciated!

Jeff Miner
Professor and Department Chair

Algae bloom in Lake Erie

By Robert Michael McKay, Ryan Professor of Biology and Director, Marine Program

I awoke the morning of Saturday, August 2, 2014, and by habit started the morning checking email on my phone. My first clue to the event that would consume much of my life for the next several months was a message from a friend living in Toledo jokingly asking if my lab had been tampering with Toledo's water supply. Minutes later, I was copied on a message from my colleague Scott Rogers mentioning "a ban on city water because of microcystin" and offering water to our biology colleagues living in the Toledo/Perrysburg area affected by the ban. Soon after that, I received another message from a friend concerned that his wife drank three cups of coffee made using tap water that morning before hearing about the ban.

Earlier that morning, the municipality of Toledo issued a do not drink advisory on their water supply, directly impacting over 500,000 residential customers and perhaps thousands of businesses. This order arose from levels of microcystin, a potent liver toxin, which rose to 2.5 times beyond acceptable limits in the city's finished drinking water supply. The culprit was a large bloom of cyanobacteria (blue-green algae) in the western basin of Lake Erie that was constrained by prevailing winds to the region around the city of Toledo's water intake.

Continued on pg. 2

Dr. George Bullerjahn collecting a water sample from Lake Erie.



ALGAE BLOOM IN LAKE ERIE CONTINUED

Frankly, the Toledo water crisis did not come as a surprise; in fact we had been skirting such an event for decades. Due to its relatively shallow nature and the high degree to which the lake and its watershed are impacted by human activity, Lake Erie is prone to blooms of algae. Warm surface water temperatures and high levels of phosphorus and nitrogen render the lake an incubator promoting abundant growth of cyanobacteria and other phytoplankton. Not only do the green-colored slicks of algae detract from the lake's value as an economically important recreational resource, some of these plankton are capable of producing toxins harmful to humans thus compromising our potable water supply.

Over the years, efforts have been made to address this problem. Prior to the onset of recurring blooms of the cyanobacterium *Microcystis* starting in the mid-1990s and which remain the main source of the problem today, pollution in Lake Erie fueled the growth of other taxa of cyanobacteria as well as green algae. In fact, the situation was so dire that an infamous Time magazine article published in 1969 declared that "Lake Erie is in danger of dying by suffocation."¹

Led by David Schindler and his pioneering whole-lake manipulation studies of Lake 226 at the Experimental Lakes Area research site in northern Ontario, phosphorus was identified as the nutrient of concern fueling prolific growth of algae in lakes (Schindler 1974, *Science* 184: 897) and reduction of phosphorus input from sewage treatment plants became a main provision of the binational Great Lakes Water Quality Agreement implemented in 1972.

While the combined effects of phosphorus reductions targeting point sources of pollution and the efficient filtering capacity of invasive zebra mussels resulted in increased lake clarity in the 1980s and early 1990s, blooms of cyanobacteria returned to Lake Erie in the mid-1990s and have recurred annually since. Dominated by the colony-forming *Microcystis* which is capable of producing the liver toxin microcystin, large-scale blooms are confined mainly to the lake's western basin, a region of the lake from which many municipalities draw their drinking water.

With our research backgrounds working on HABs, my BGSU colleague George Bullerjahn and I were quickly pressed into action to help lead the BGSU response to this crisis. Over the following weeks, we interacted with both television and print press and served on several regional panels communicating the issues to a concerned public.



Robert McKay @McKayBGSU • Aug 2

Breaking! Aquaman found dead in his Toledo home bathtub! #emptyglasscity



Robert McKay @McKayBGSU • Aug 6

BGSU Biologist talks about algal bloom solutions - <http://13abc.com> Toledo (OH) News, Weather and Sports <http://www.13abc.com/Clip/10441623/biologist-talks-about-algal-bloom-solutions#.U-lm0bPPZoA.twitter...>



During the height of the HAB event, we also coordinated with Dr. Tim Davis, a collaborator from NOAA's Great Lakes Environmental Research Lab in Ann Arbor to collect samples to inform us as to "why" the algae bloom was so dense and prolific in early August. Tim was joined by BGSU biology graduate students Taylor Tuttle and Emily Davenport during several lake surveys conducted in the days following the water crisis. While various regional monitoring efforts were rushing to measure basic water quality parameters, those approaches cannot tell us why the cells were producing high levels of toxin at the time of the crisis. Indeed, hind-casting (i.e., understanding the environmental conditions that led to HAB events) when blooms occur is incredibly difficult as the static measures collected during basic water quality monitoring all have most likely changed since the start of a bloom. To address this, our goal has been to look at all the processes associated with the physiology of the cells within the bloom event using environmental RNA sequencing (metatranscriptomics). This information will help to identify the specific physiological and biochemical pathways that were active while the bloom was in progress since these processes are a function of the chemistry of the system prior to bloom formation.

Moving forward, we have received in-kind support from the Department of Energy's Joint Genome Institute to sequence and annotate (i.e. read the genetic "blueprints") the genomes and transcriptomes of samples collected during the water crisis. We are also working closely with our colleague Dr. Steve Wilhelm from The University of Tennessee as we adopt this "systems biology" approach to analyzing the bloom. Data output from this study will map active pathways within cells which should allow us to identify the drivers of bloom events based on what the cells are "doing".

In addition to our ongoing work in the field and lab, we (along with Department of Biological

Sciences Chair, Jeff Miner) have worked closely over the past year with the office of Congressman Bob Latta (R-OH 5th District) to develop legislation aimed at addressing the persistent blooms of cyanobacteria that negatively affect our state's most important natural resource. These actions have culminated with the recent introduction of two bills by the Representative. The "Great Lakes and Fresh Water Algal Bloom Information Act" (H.R. 5456, S. 2798) aims to create a consolidated electronic database providing information collected by various agencies related to harmful algal blooms. The "Protecting our Great Lakes Act" (H.R. 5516) will help to mitigate harmful algal blooms by prohibiting the discharge of dredged material in the open waters of the Great Lakes.

Reflecting the commitment of the University to this important issue, BGSU will host an international workshop "Global Solutions to Regional Problems: Collecting Global Expertise to the Problem of Harmful Algal Blooms" in mid-April. Co-sponsored by BGSU, the National Science Foundation and NOAA, the workshop will focus on the current science on bloom forming cyanobacteria and the factors contributing to these blooms, along with identifying knowledge gaps regarding bloom prevention and remediation. Additionally, discussion of case studies on current and prior remediation programs will help guide the development of a workshop whitepaper that presents potential future strategies for bloom prevention and long-term research goals.

With Lake Erie now at the forefront of national debate over stewardship of our fresh water resources, we are energized and positioned to help lead BGSU efforts that will help to address both the causes and control of these persistent harmful algal blooms.

¹ "America's Sewage System and the Price of Optimism" Time Magazine, Friday, Aug. 01, 1969



Marine Lab Operations Fund Endowed

By Robert Michael McKay, Ryan Professor of Biology and Director, Marine Program

Thanks to the generosity of Marine Program friends, alumni and of course, Marine Lab Founder and Emeritus Director **Cindy Stong**, our fundraising campaign to create an endowment for marine lab operations was a success! The Marine Lab Operations Endowment was formally created in July and as it grows, will help to ensure sufficient resources for the lab into the future. As part of the creation of the endowment, Cindy visited campus in September for a donor's dinner, met with a section of the popular general education course Life in the Sea and spent time in the marine lab visiting with us.

It probably comes as no surprise that Cindy is already starting to plan for a 60th Anniversary celebration. Before getting ahead of ourselves, we are still taking care of some business related to the 50th Anniversary and I am happy to report that we now have the first set of images online available for viewing. These are candid shots collected by Cindy spanning her 30-plus year career at BGSU which were digitized last fall by Mike Godfrey and Terry McKibben '80, and which played as a slide show during the banquet. The images are available at the online image sharing site imgur: <http://imgur.com/a/qpQSB> and can be downloaded individually or as the entire set. Thanks to current student Geoff Phillips for uploading the images for us.



The Biology Class That Had It All

By Jim Mackovjak '72

“It wasn’t just their first-rate intellects or teaching ability that made the class so special, or their high standards (a typographical error in a research paper was fatal, an automatic F); it was also their desire to make us students gain, in conjunction with a scientific understanding, an appreciation of our natural environment.”

I was a student at Bowling Green State University during the late 1960s and was fortunate for two quarters to be enrolled in the biology department’s terrestrial ecology class. It was the best experience of my college education. The class was taught by ecologist William Jackson, botanist Ernest Hamilton, and geologist Jane Forsythe. They were all accomplished scientists and enthusiastic, capable teachers. And each had a fine sense of humor.

As I recall, one couldn’t just sign up for the class, but had to ask. Furthermore, each accepted student was required to provide a written acknowledgment by the professor of other classes that he or she was enrolled in stating that the professor understood that the terrestrial ecology class would be very demanding of the student’s time and the student would have little time for other schoolwork. About a dozen students, most of them in the biology department’s graduate program, were enrolled in terrestrial ecology.

The highlights of the class were the two- and three-day field trips we took to various locations in Ohio and Indiana. We traveled in a convoy of three vehicles—one an ancient International Harvester Travelall station wagon—and prior to leaving, were given a mimeographed sheet

of hand signals that mostly indicated geological features we would pass along the way. The hand signals were initiated by Dr. Forsythe, who rode shotgun in the lead vehicle. Her signals were then repeated by the shotgun passenger in the middle vehicle for the benefit of those in the rear vehicle. We students laughed about the hands flailing out the windows, but we knew “Jungle Jane” Forsythe was serious and that a question about one or more of the features might appear on a test.

Our accommodations during the field trips were tents, and we cooked over Coleman stoves. I recall that the daily routine during a spring visit to Neatoma Valley, in central Ohio, involved a compulsory early morning bird walk, after which we brewed a pot of coffee and ate breakfast. We then spent the day identifying and quantifying the vegetation in a series of plots. An especially pleasing aspect of the work was gathering a supply of morel mushrooms, which, sautéed lightly in butter, enhanced our evening meals. After dinner, we sat around picnic tables and compiled the data we had collected during the day. The three professors then led an around-the-campfire discussion of what we had observed.

Thinking about today’s students at BGSU, I hope they have opportunities similar to those I enjoyed in the terrestrial ecology class. Nothing in my education matched being in class or the field with Drs. Forsythe, Jackson, and Hamilton. It wasn’t just their first-rate intellects or teaching ability that made the class so special, or their high standards (a typographical error in a research paper was fatal, an automatic F); it was also their desire to make us students gain, in conjunction with a scientific understanding, an appreciation of our natural environment. This desire was demonstrated by Dr. Jackson’s reading aloud during class passages from Aldo Leopold’s *Sand County Almanac*: “We sensed that these two piles of sawdust were something more than wood: that they were the integrated transect of a century; that our saw was biting its way, stroke by stroke, decade by decade, into the chronology of a lifetime, written in concentric annual rings of good oak.”



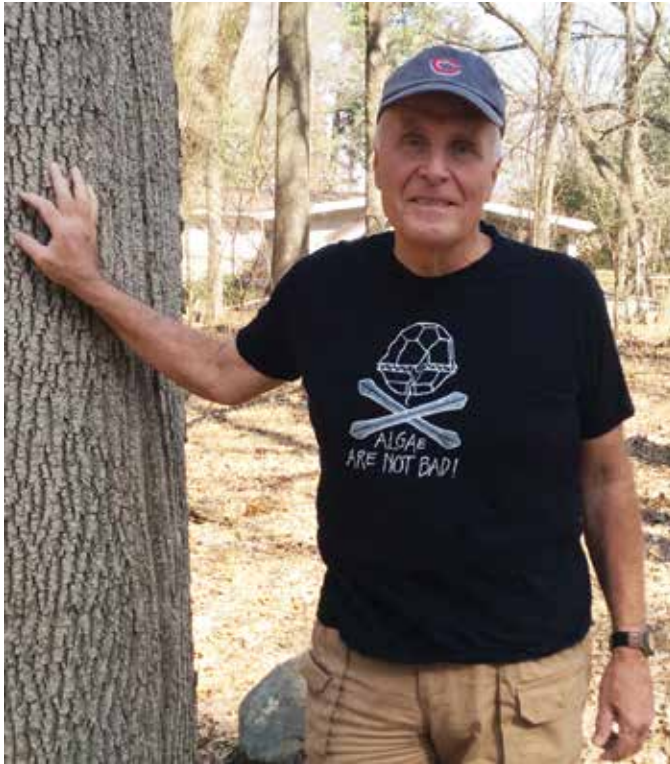
BGSU biology student receives prestigious undergraduate fellowship from the US EPA

Congratulations to **Bobbi Carter**, a recipient of an EPA Greater Research Opportunities (GRO) Fellowship for Undergraduate Environmental Study.

Bobbi, a Cincinnati native, is a BGSU junior biology major specializing in ecology and conservation biology. During her two-year fellowship period, Bobbi will continue research in collaboration with BGSU biology professor Shannon Pelini and complete a summer internship at an EPA facility.

Bobbi’s commitment to environmental biology and outreach is also demonstrated by her extracurricular activities, where she thrives as a leader and collaborator. She founded and is president of the BGSU Ecology and Conservation Association. As president of this group, she has effectively brought together students and faculty interested in ecological research and career preparation. She is also the president of Northwest Ohio’s chapter of the Society for Conservation Biology. She has won numerous other awards from Girl Scouts and Clean Streams Cincinnati for her service to local conservation efforts.

We look forward to Bobbi’s continued success in her endeavors.



Dr. Lowe reminding us that not all algae are harmful, and most are good.

Lowe receives the 2014 Phycological Society of America Award for Excellence

According to the PSA newsletter, **Dr. Rex L. Lowe**, professor emeritus, biological sciences, was recognized for his nearly 50 years of sustained excellence in research, service and teaching in algal biology. During that time he has authored or co-authored four books or monographs, has been awarded almost 70 research grants, and has contributed over 130 peer-reviewed journal articles on a wide range of topics. His areas of study have included basic and applied ecology, taxonomy, biodiversity, saprobity, invasive and endemic species, environmental assessment and a wide variety of algal groups.

Dr. Lowe's impact on the field of Phycology is exemplified by his influence on the careers of several generations of algal researchers and educators. As noted by his primary nominator, "The impact of his teaching cannot in reality be measured. For as long as I can remember, his teaching at university and field stations has changed the lives of countless undergraduate students."

Phuntumart Gives Keynote at Asian Plant Pathology Conference

Pathogens in soybeans are a big problem not only in the U.S., but also around the world and no more so than in Asia, where soy is a major food source. Asian countries buy much of their soy from the U.S.

Dr. Vipaporn Phuntumart, biological sciences, studies a major culprit among soy pathogens, *Phytophthora sojae*, which causes the plants to rot by suppressing the plant's resistance to invaders.

Her work could have an impact in the U.S., the second-largest producer of soybeans worldwide, and even in Wood County, which, until recently, was the largest producer in Ohio. It represents another approach to fighting the pathogen that does not depend on fungicides, "which are of limited use and are toxic," she said.

Phuntumart shared her research as one of the keynote speakers at the fifth Asian Conference on Plant Pathology, held in Chaing



Mai, Thailand, Nov. 2-6. She was the only one of the international speakers who is working in the particular area of epigenetics, which deals with changeable traits that are not caused by changes to the actual DNA, but can be inherited and are adaptive to their environment.

Through a system of epigenetics, *P. sojae* does not change the DNA in the plant's genome but instead changes the way the DNA strands are modified and packed, to "silence" or "activate" their gene products to avoid detection by soybean plants, Phuntumart explained.

"My goal is to find a target that will have an impact on its genome," she said.

P. sojae is particularly good at adapting its physiology to the environment, Phuntumart observed, and in fact depends on being in the right environment to reproduce. Her team found that *P. sojae* cultured in the lab for a long period of time without exposure to soybeans eventually loses its infectious ability. And pathogens lying in fields remain dormant until

the right weather conditions arise, and there is enough moisture for the zoospores to swim toward the host plants.

Phuntumart's research is funded by the U.S. Department of Agriculture. She is part of a team of 28 scientists that has been awarded a five-year, \$9.28 million grant by USDA National Institute of Food and Agriculture. Led by Dr. Brett Tyler, now at Oregon State University, the project's goal is to engineer new disease-resistance strategies to reduce soybean crop yield losses due to root and stem rots.

"Many students have been involved in the project and have gotten good jobs after they graduate," Phuntumart said. Four of her graduate students from one year who all did undergraduate research in her BGSU lab before their graduate studies have become researchers. Jennifer Benson is at the University of Colorado, working on human genetics; Michael Ludwig is at the University of California, in stem cell research. Brian Rutter is conducting plant research at Indiana University, and Maribeth Spangler is at Cleveland Clinic. Undergraduates who participated have gone on to medical school and other promising programs, thanks to support from CURS and the USDA, she said.

While in Thailand, Phuntumart also gave a workshop and worked to recruit more students to come to BGSU.



BGSU dominates science poster presentation awards

Two biology undergraduates received awards for poster presentations at an Undergraduate Research/Graduate School (URGS) Retreat organized by the University of Tennessee, Knoxville in partnership with the Tennessee Solar Conversion and Storage using Outreach, Research, and Education (TN-SCORE).

Nadejda Mirochnitchenko was awarded first place in the Science Poster competition for presenting her poster entitled: "Sources of contamination within the upper tributaries of the Portage watershed to reduce harmful algal blooms in Lake Erie."

Cole Olmstead was awarded third place in the same competition for his presentation of a poster entitled "Corn snake odd gene reduces viability and fertility."

Dr. Robert Charles Graves

Dr. Robert Charles Graves, age 84, of Bowling Green, OH, passed away suddenly Friday, October 24, 2014, in Bowling Green, OH. He was born in Evanston, IL on October 24, 1930, to Robert Osborne Graves and Florence Ellen (Pogue) Graves. He grew up in Chicago, IL.

In 1948, he returned to Evanston and attended Northwestern University where he graduated Phi Beta Kappa with a B.S., M.S. and Ph.D. in Biological Sciences. He was an Emeritus Professor at Bowling Green State University where he taught Entomology/Ecology and a variety of biology courses from 1966-1993. Prior to that he taught at the University of Michigan-Mott in Flint, MI from 1957-1966, and at Lake Forest College from 1956-1957. He enjoyed the teaching process and loved his students, bringing them into his home as part of his extended family. He loved the outdoors and spent many years traveling around the country with his family, camping and studying the flora and fauna. He was editor of numerous journals of entomology and authored many scientific papers and a book co-authored with David W. Brzsoka on Tiger Beetles of Ohio. He had an excellent sense of humor and enjoyed telling stories. He was a master narrator who could change his voice and accents as required to make the story come to life. His youth, spent in a growing city populated by people from all over the world, allowed him to speak with many of the different accents. He was a very well read man and knew a little about almost everything and a great deal about a lot of things. He was a mentor to many graduate students in Entomology.

Robert is survived by his loving wife of 58 years, Anne; his three children, Charles "Chip" Graves of Bowling Green, OH (Lora), Anita Graves of Sandy, UT and Robert Graves of Murray, UT (Felecia). He has two grandchildren, Erin and Dylan Graves. He was preceded in death by his parents, Robert and Florence Graves.



Reprinted from The Blade.



Can you spot the lizard? The lizard in this photo is a New Caledonian giant gecko that was captive bred in the BGSU Herpetarium.

Welcome Dr. McCluney

We want to welcome **Dr. Kevin McCluney** to our faculty. McCluney's research focuses on the ecology of animals, especially focusing on how water quantity and quality influences aquatic and terrestrial food webs. "As a child growing up in Florida near coastal estuaries, freshwater springs, and beaches, I was always fascinated by nature," McCluney said. He received his BS from Florida State University, where, under the direction of Dr. Frances James, he completed an honors thesis that focused on how fire intensity influenced the conservation of the endangered red-cockaded woodpecker, through changes to vegetation.

McCluney then moved west, beginning a PhD at Arizona State University under the direction of Dr. John Sabo. His ideas about how water affects terrestrial food webs began to take shape in his first months in Arizona, when he noticed the stark contrast between rivers and deserts and learned these rivers were drying with increasing frequency. In one of his most important discoveries he found that under dry conditions, streamside spiders were drinking crickets and crickets were drinking leaves, seeking water rather than energy or nutrients, and thus the food web was functioning as more of a water web.

Following his PhD, McCluney worked as a post-doctoral fellow for approximately one year at Colorado State University (LeRoy Poff



and Jill Baron), Arizona State University (John Sabo), and North Carolina State University (Steve Frank). These experiences broadened his research to examine riverine ecology at large-scales and extended his research on water webs to answer new questions in streamside and urban ecosystems.

McCluney's lab at BGSU

is growing quickly, with two new PhD students, Jamie Becker and Melanie Marshall, and undergraduates including Nadejda Mirochnichenko and Haley Ingram. Together they are investigating the functioning of water webs in the lab, in urban systems, and around the US, how trace chemicals in water (e.g. caffeine) influence linked aquatic-terrestrial food webs in local river systems, and the causes (nutrient sources) and consequences (lakeshore food webs) of microcystin-producing algal blooms. McCluney is excited about teaching courses in invertebrate zoology, stable isotope ecology, and others, and setting up research in his new lab space. He continues to actively recruit graduate and undergraduate students.

Department **NEWS**



- The Center for Microscopy and Microanalysis has a new confocal microscope for research and instruction in **Dr. Carol Heckman's** Light Microscopes and 3D Imaging course.
- Last spring, the Pasakarnis-Buchanan Lecture featured **Dr. Arturo Casadevall**, Professor of Medicine and Microbiology and Immunology at Albert Einstein College of Medicine. Dr. Casadevall gave a talk entitled, "Science at a Crossroads: Time for Reform."
- The following papers have been accepted for publication in the open access journal, *Endocrine Disruptors*:
Dena Krishnan, Howard C. Cromwell, and Lee Meserve. *Effects of Polychlorinated Biphenyl (PCB) Exposure on Response Perseveration and Ultrasonic Vocalization in Rat During Development.*
E. Nicole Dover, David E. Mankin, Howard C. Cromwell, Vipaporn Phuntumart, and Lee A. Meserve. *Polychlorinated Biphenyl Exposure Alters Oxytocin Gene Expression and Maternal Behavior in Rat Model.*
- **Dr. Scott Rogers** was quoted in the New York Times article, "Out of Siberian Ice, a Virus Revived" dated March 2014. Researchers have revived a virus from Siberian permafrost more than 30,000 years old. To read the article, visit http://www.nytimes.com/2014/03/04/science/out-of-siberian-ice-a-virus-revived.html?_r=0



Frieda stopped by the Department of Biological Sciences to celebrate Homecoming week with Kathryn Rapin and Susan Schooner (front row) and Raven Ory, Dan Pavuk, DeeDee Wentland, Jeff Miner, and Chris Hess (back row).

BIOLOGICAL SCIENCES SCHOLARSHIPS

Following is a list of funded scholarships that are available to our undergraduate and graduate students thanks to the generous contributions of alumni, friends and other donors. We thankfully accept donations to any of these scholarships for the assistance of our students.

The following scholarships are provided for Incoming First-Year Students:

Robert C. Romans Biology Scholarship (est. 1994)

Awarded annually to at least one incoming first-year student who is majoring in biology. Requirements: 3.0 minimum high school GPA and graduate from any high school in Defiance, Fulton, Hancock, Henry, Ottawa, Sandusky, Seneca, Williams or Wood counties in Ohio.

Alumni Freshman Scholarship (est. 1994)

Awarded annually to incoming first-year biology majors. Scholarships are awarded from committee evaluation of applicants' high school GPA, standardized test scores, school and community activities and recommendation letters.

The following scholarships are provided for Sophomores:

Biology Alumni Sophomore Scholarship (est. 1984; modified 1990)

Awarded annually to a full-time biology major who will be a sophomore during the academic year scholarship funds are used. Requirements: 3.0 minimum GPA and demonstrated potential for a successful undergraduate experience at BGSU.

Myra L. Patchen Biology Scholarship (est. 2008)

Awarded annually to an Ohio resident biology major who will be a sophomore during the academic year scholarship funds are used. Requirements: Overall GPA of 3.7; science GPA of 3.5. Preference given to students participating in research with a biology faculty member. Renewable if all criteria continue to be met.

The following scholarship is provided for Sophomores or Juniors:

Joseph J. and Marie P. Schedel Scholarship (est. 1991)

Awarded annually to a full-time biology major who will be a sophomore or junior during the academic year scholarship funds are used. Requirements: 3.0 minimum GPA and demonstrated interest in environmental concerns.

The following scholarships are provided for Sophomores, Juniors or Seniors:

T. Richard Fisher Biology Scholarship (est. 1990)

Awarded annually to a biology major who is interested in ecology or the plant sciences. Requirements: 3.0 minimum GPA and 30 semester hours completed at BGSU.

Multicultural Student Scholarship (est. 1990)

Awarded annually to a minority student biology major who will be a sophomore, junior, or senior during the academic year scholarship funds are used. Requirements: 3.0 minimum GPA

and evidence of leadership potential through participation in departmental or university activities.

Harold E. Tinnappel Scholarship (est. 1971)

Awarded annually to a continuing, full-time student who by an outstanding record has indicated a potential for a high level of success in the sciences. Preference will be given to an applicant who has a vocational interest in conservation, horticulture, or botany. The scholarship is renewable.

Steven S. Steel Scholarship (est. 1996)

Awarded annually to a biology or chemistry major who will be a sophomore, junior, or senior during the academic year scholarship funds are used. Requirements: Sophomores must have a 2.0 minimum GPA; juniors and seniors must have a 2.5 minimum GPA. Recipients must complete an off-campus internship experience; applications must include a description of how the internship will assist the student in his/her academic endeavors. A final report or journal must be submitted upon completion of the internship experience.

Arlene E. Stearns Biology Scholarship (est. 2005)

When funded sufficiently, will be awarded to a traditional or non-traditional Biology major with financial need who is a resident of Michigan. Requirements: 3.2 minimum GPA. The scholarship is renewable if all criteria continue to be met.

The following award is provided for Juniors:

Karlin Award (est. 1968)

Awarded annually to a junior biology major who is involved in departmental activities and nominated by Biological Sciences faculty members. Requirement: 3.5 minimum GPA.

The following scholarships are provided for Juniors or Seniors:

Ralph V. McKinney, Jr.-Eloise Whitwer Scholarship (est. 1992)

Awarded annually to a biology major who will be a junior or senior during the academic year scholarship funds are used. The recipient shall have demonstrated significant commitment and exhibited promise of future distinction in a career in the biological sciences. Additionally, the recipient shall have demonstrated an understanding of the importance of helping others by a record of involvement in university or community activities.

Barry R. Morstain Scholarship in Biology (est. 1998)

Awarded annually to a biology major who will be a junior or senior during the academic year scholarship funds are used. Strong preference will be given to minority students. Requirement: 3.0 minimum GPA.

Cynthia Collin Stong Marine Biology Scholarship (est. 2003)

Awarded annually to up to three marine biology students accepted into an approved summer field program at a marine station. Preference given to students enrolling in the 10-week Gulf Coast Research Laboratory program. Applicants' academic record and potential to contribute knowledge and experience to others in marine program, as well as financial need, will be considered.

Waldo and Evelyn Steidtmann Scholarship (est. 1983)

Awarded annually to a biology major who will be a junior or senior during the academic year scholarship funds are used. Preference will be given to students with an interest in the plant sciences or environmental concerns. Requirements: 3.3 minimum GPA and 30 semester hours completed at BGSU.

James D. Graham Memorial Scholarship (est. 1984)

Awarded annually to an outstanding biology major who will be a junior or senior during the academic year scholarship funds are used. The scholarship is non-renewable. Preference will be given to students with an interest in cellular and molecular biology. Requirements: 3.3 minimum GPA and 30 semester hours completed at BGSU.

Dennis R. Whitmore Memorial Scholarship (est. 1987)

Awarded annually to a declared microbiology or biology major who will be a junior or senior during the academic year scholarship funds are used. The award is designed for a student with a commitment to microbiology or molecular biology. Requirements: 3.3 minimum GPA and 30 semester hours completed at BGSU.

Jean Pasakarnis Buchanan Scholarship (est. 1987)

Awarded annually to a biology or medical technology major who will be a junior or senior during the academic year scholarship funds are used. Requirements: 3.3 minimum GPA and 30 semester hours completed at BGSU.

Dr. Suzanne K. Miller Undergraduate Research Assistantships (est. 1998)

Up to ten assistantships are awarded annually to biology majors who will be Juniors or seniors during the year the assistantship is completed. Assistants work for one semester (10 hours/week) as a research apprentice with a faculty member in the department. Requirement: Enrollment in BIOL 4010 (Introduction to Research) during the semester of the assistantship (min. one hour credit).

The following scholarship is provided for Seniors:

Dawson S. and Sylvia A. Patterson Scholarship (est. 1979)

Awarded annually to a biology or chemistry pre-medicine major who will be a senior during the academic year scholarship funds are used.

The following scholarship is provided for Graduate Students:

Larry and Linda Oman Graduate Scholarship (est. 2000)

Awarded to an advanced graduate student whose major area of study is in ecology/environmental biology. The recipient must be an outstanding student as demonstrated by his/her scholarly pursuits and research. The scholarship is renewable if criteria are met.

Bio:Life

Biological Sciences Scholarship and Award Recipients

Following is the list of scholarship recipients for 2014-15. This list includes awards for graduating seniors. Congratulations to these outstanding students and special thanks to our donors.

To view scholarship criteria, please visit: www.bgsu.edu/departments/biology/programs/undergrad/scholarships.

Alpha Epsilon Delta Award

Morgan Burgner (Wadsworth, OH)

Karlin Award

Amber Gombash (Delta, OH)

Beta Beta Beta Award

Brittany Yarnell (Napoleon, OH)

Biology Alumni Freshman Scholarship

(incoming freshmen)

Not awarded

Biology Alumni Sophomore Scholarship

Hannah Carver (Clayton, OH)
Maggie Caswell (Uniontown, OH)
Scott Heidler (Hudson, OH)
Kyle Moss (Howard, OH)

Jean Pasakarnis Buchanan Scholarship

Joseph Basalla (Lakewood, OH)
Tationa Dennard (Southfield, MI)
Kayla Effinger (Carmel, IN)
Amber Gombash (Delta, OH)
Jillian Wray (Lowell, MI)

T. Richard Fisher Biology Scholarship

Jenifer Nord (Stow, OH)
Cole Olmstead (Potsdam, NY)
Carmen Wimberley (Detroit, MI)

James D. Graham Memorial Scholarship

Alexandra Corrigan (Avon Lake, OH)
Bilikis Ibikunle (Bowling Green, OH)
Aparna Sharma (Bryan, OH)

Ralph V. McKinney, Jr. – Eloise Whitwer Scholarship

Jazzmine Caldwell (Dayton, OH)
Jocelyn Williams (Perrysburg, OH)
Devin Wrice (Lorain, OH)

Suzanne K. Miller Undergraduate Research Assistantship

Katherine Bland (Mason, OH)
Rebecca Breidenbach (Sylvania, OH)
Alex Brown (Beachwood, OH)
Amber Gombash (Delta, OH)
Alexander Howard (Bowling Green, OH)
Keely Jordan (Sullivan, OH)
Noah Newsome (Kirtland, OH)
Derek Smith (Toledo, OH)
Morgan Tantillo (Honeoye Falls, NY)

Barry R. Morstain Scholarship in Biology

Molly Beattie (Bowling Green, OH)
Ashley Dallas (Cincinnati, OH)
Megan Fisher (Cincinnati, OH)
Mary Scott (Maumee, OH)

Multicultural Student Scholarship

Dominique Kassa (Holland, OH)

Linda and Larry Oman Scholarship

(graduate students)

Matthew Cross (Bowling Green, OH)
Sarah Lahman (Bowling Green, OH)

Myra L. Patchen Biology Scholarship

Jamie Justice (Lucasville, OH)

Dawson S. and Sylvia A. Patterson Scholarship

Olivia Birck (Fairfield, OH)
James Hozalski (Wakeman, OH)
Kyle Smay (Defiance, OH)

Robert C. Romans Biology Scholarship

(incoming freshmen)

Rachel Bienemann (Perrysburg, OH)
Katelynn Conley (Northwood, OH)
Erica Eskins (Clyde, OH)

Joseph J. and Marie P. Schedel Scholarship

Dylan Cronin (Aurora, OH)
William Gyurgyik (Cleveland, OH)
Cynthia Ocana (Perrysburg, OH)
Hallie Zimmer (Cambridge, OH)

Steven S. Steel Scholarship

Danielle Therrien (Lake Ann, MI)

Waldo and Evelyn Steidtmann Scholarship

Leanne Brittain (Monroe, MI)
Danielle Callicoa (St. Paris, OH)
Bobbi Carter (Amelia, OH)
Emily DeArmon (Westlake, OH)
Kelly Leffler (Aurora, OH)

Cynthia Collin Stong Marine Biology Scholarship

Leanne Brittain (Monroe, MI)
Megan Fisher (Cincinnati, OH)

Harold E. Tinnappel Scholarship

Sarah Bail (Springfield, OH)
Nadejda Mirochnitchenko (Oregon, OH)

Dennis R. Whitmore Memorial Scholarship

Katherine Bland (Mason, OH)
Alexander Howard (Bowling Green, OH)
Jacob Werner (Bowling Green, OH)

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