

Newsletter

Research Spotlight

NRV, Virginia

Dr. Emmanuel Frimpong



SPRING 2018 Vol. III ISSUE I & II | FISHWILD.VT.EDU

RESEARCH SPOTLIGHT



Emmanuel envisions his fish ecology and conservation research and teaching program as influencing a future where large conservationand accessible to scientists, but are including aquaculture in developing

Dr. Emmanuel Frimpong

Following two years as a postdoc and a research scientist in the department, Emmanuel Frimpong has followed a consistent annual routine for 10 years as a faculty member. In a typical year for Emmanuel, the warming at the onset of spring means time to wrap up classroom teaching and prepare for two concurrent field seasons; one focused on the reproductive ecology and conservation of minnows in the southeastern United States and one that takes him across the Atlantic Ocean to sub-Saharan Africa where he focuses on aquaculture and conservation of Afro-tropical freshwater fishes. Out of the field season, Emmanuel's research involves the compilation and modeling of large data sets to address conservation questions on continental to global scales.

Emmanuel received an interdisciplinary Ph.D. in Fisheries and Aquatic Sciences and Natural Resources Policy from Purdue University in 2005 and a B.S. in Natural Resources Management from University of Science and Technology in Ghana in 1997. He also received M.S. degrees in Aquaculture and Fisheries from the University of Arkansas at Pine Bluff in 2001 and Statistics from Virginia Tech in 2009.

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With funding from the National Science Foundation and the Virginia Tech Global Change Center (GCC), Emmanuel's research here in Virginia has addressed the central question of the effect of reproductive mutualisms on the population dynamics of stream minnows and the influence of anthropogenic processes, such as landscape scale habitat alterations and introduction of non-native species, on the outcomes of these interactions. The New River basin, largely within convenient distance from the university, with high native richness of minnows (Cyprinidae), many introduced species, and a history of landscape and stream habitat alterations by humans, provides an excellent laboratory for Emmanuel's research. In collaboration with the GCC colleagues Paul Angermeier and Jacob Barney, Emmanuel's line of research is now focusing more keenly on the influence of three common nest-building species (Bluehead Chub, Central Stoneroller, and Creek Chub) on populations of their nest associate species, including their potential role

in aiding the establishment and spread of non-native species.

The Aquatic Gap Analysis program of the US Geological Survey has also supported Emmanuel's lab. Emmanuel, along with his collaborators, has assembled a large data set on the distribution and life histories of North American

freshwater fishes. With this data set, Emmanuel and his collaborators have been able to investigate the influence of human habitat alteration on the conservation status of freshwater fishes and the role of mutualistic interactions in creating fish assemblage resistance and resilience.

Emmanuel also continues research focused on nationalscale modeling and assessments of fish biodiversity. He has combined modeling with service to federal and state agencies and the scientific community by developing and publishing several databases, including FishTraits and IchthyMaps, both of which are used by scientists throughout the world.

displays a Nile Tilapia

Gifty Anane-Taabeah

With funding from the USAID AquaFish Innovation Lab, Emmanuel has also maintained an active international research program focused on sustainable aguaculture development in Ghana, Kenya, and Tanzania. This aspect of Emmanuel's program involves substantial outreach, engagement, and mentoring of students and young scientists in their home countries. In collaboration with colleague Eric Hallerman, Emmanuel's current Ph.D. student and VT Interfaces of Global Chance IGEP Fellow, Gifty Anane-Taabeah, is studying the population genetic diversity and conservation of the globally common aquaculture species, the Nile Tilapia (Oreochromis niloticus). Gifty's work has attracted additional support from the Rufford Conservation Foundation, UK. Through collaboration with colleague Leandro Castello, Emmanuel is starting research on sustainability of inland fisheries and fish conservation in other sub-Saharan African countries, including Cameroon and the Democratic Republic of Congo.



Students, both graduate and undergraduate, are integrated into Emmanuel's research, teaching, and outreach. He has taught undergraduate classes in fisheries techniques and fish ecology, and teaches a graduate class in spatial modeling of species and habitat. Many undergraduate students from across departments on campus have taken Emmanuel's classes,

joined his lab and field crews, and ended up developing a research project that he published with them and other collaborating graduate students. Most of his undergraduates have gone on to graduate school a few years after graduation, whereas his graduate students have gone to U.S. and international agencies and academic positions. Emmanuel continues to serve on many graduate student committees across the university, and students often seek him out to provide analytical rigor to their thesis and dissertation projects- the same concepts he emphasizes in his classes and field work with students.

The reach of the Virginia Cooperative Fish and Wildlife Research Unit in 2017 extended from the Atlantic Ocean in the east to the Mississippi River in the west and from the Savannah River in the south to Lake Ontario in the north. The unit engaged 15 graduate students and 4 post-doctoral research associates. Hotel award points aside, the 32 various state and federal agency permits may be the better metric to assess the scope of work completed in 2017! The annual Cooperator's Meeting took place August 15. 2017 in Cheatham Hall with representatives from the department, the college, the

Virginia Department of Game and Inland Fisheries, the U.S. Fish and Wildlife Service, the U.S. Geological Survey, and the U.S. Forest Service in attendance. While the students of the Unit have always maintained a high degree of scholarship through publication of their work in academic journals, this past year was especially notable for outreach at professional meetings where 49 presentations were made by students.

On the wet side, Tiz Mogollón just finished her M.S. research examining flood management and how to understand spatially the flood-regulating capacity of watersheds. She analyzed data from 31 watersheds across Virginia and North Carolina, each with at least a 20-year record of river flow. She observed that watershed features do not affect large floods but that engineered flood-control features, such as storm-water retention ponds, can reduce the size of small floods. Moreover, despite decreasing precipitation since 1991, flood "flashiness" has increased in urban areas that have lost forest cover and have few flood-control features. Tiz introduced a new method to map the capacity of



watersheds to regulate floods and showed that strategic use of watershed features can reduce flood size. Her findings are germane to Virginians and North Carolinians who live or own land near rivers, and to agencies and municipalities who invest in flood control measures to ensure that flood protection investments consider the limitations imposed by the watershed to regulate floods as climate and land-use change.

Corey Dunn, another recent M.S. graduate played a significant role in the U.S. Fish and Wildlife Service's 2017 recommendation to list the Candy Darter (Etheostoma osburni) as Threatened under the Endangered Species Act. His work provided the Service important new findings about the relationship between micro-habitat suitability and the robustness of individual Candy Darter populations, and how instream factors such as temperature and fine sediment interact to influence population persistence.

On the dry side, Lauren Austin, recently finished her M.S. degree researching the effect of prescribed burning for forest restoration as well as wildfire on the George Washington National Forest, the TNC Warm Springs Preserve, and Shenandoah National Park. She found that the activity of large-bodied bats, such as the big brown bat (*Eptesicus fuscus*) adapted to foraging in more open conditions, responded favorably to hot fires or repeated prescribed fires that changed overstory structure in the forest. Bats of high conservation concern, such as the threatened northern long-eared bat (*Myotis* septentrionalis), showed neutral to positive responses, suggesting that the presence of bats should not limit or curtail efforts to return fire to the central Appalachian landscape to benefit other stewardship needs.

Another recent M.S. graduate, Mike Muthersbaugh, examined day-roost ecology of northern long-eared bats in the same forests studied by Lauren. His work showed northern long-eared bats adapted to forest conditions at very small scales by taking advantage of trees and snags in burned areas, harvested stands, and insect-damaged patches.



This summer, current M.S. students Elaine Barr, Tomas Nocera and Sam Freeze, and Ph.D. student Sabrina Deeley, led a "bat blitz" at Rock Creek Park in the District of Columbia. The bat blitz was attended by House and Senate Natural Resource Committee members and staff of the National Park Service, U.S. Fish and Wildlife Service, U.S. Geological Survey, and District of Columbia Department of Energy and Environment. All attendees were impressed by the student's knowledge and passion for bats. Lastly, Post-doctoral researcher, Dr. Corinne Diggins, recently received the 2018 Tanner Fellowship Award to continue her work on the endangered Carolina northern flying squirrel (Glaucomys sabrinus coloratus) in the Great Smoky Mountains National Park. Congratulations, Corinne!

Message from the Department Head

We are coming of age with this issue of the newsletter. Therefore, I wanted to communicate a description of the department as it stands today and I have been told the best way to accomplish this goal is through infographics. So, over the next several pages you will find an assortment of infographics that we hope will tell you something about the department, its structure, and its productivity.

> Joel Snodgrass Department Head

DEPARTMENT OF FISH & WILDLIFE CONSERVATION By the Numbers



RESEARCH TRENDS

Web of Science **Peered-reviewed** PUBLICATION CATEGORIES

*More than 100 funding

*data from the Office of Sponsored **Programs**. Virginia



Undergraduates Travel to Ecuador for Life Changing Experience

Traveling to other countries can have a profound, life-long impact on our undergraduate students. This past summer, Drs. William Hopkins (FWC) and Ignacio Moore (BIOL) teamedup again to teach Tropical Ecology and Conservation. The two-semester course includes a 3+ week adventure to Ecuador, one of the most biodiverse countries in the world, but among the most economically challenged countries in South America.

The juxtaposition of poverty and biodiversity creates enormous educational opportunities, as students learn first-hand how challenging it is to balance the needs of people and the environment. With oil prices crashing (the most important sector of Ecuador's economy), Zika virus concerns hurting tourism, and

the recent series of devastating earthquakes, the 2016 course was particularly timely.

Students traveled deep into the Amazon basin to study hundreds of rare wildlife species including more than a dozen species of primates, ocelots, anteaters, sloths, boa constrictors, caimans, and many species of toucans, macaws, and parrots. They even observed extremely rare Harpy and Crested Eagles!

The students visited with two indigenous cultures, the Quichua and Hoarani, where they learned about threats to their communities posed by western interests and the economic downturn. They also learned how to harvest traditional

crops from their gardens, use their blowguns, carve their own darts, and harvest and prepare diverse plants for medicinal purposes. They even had the opportunity to try important staple foods like grubs!

From the lowlands, the students traveled through the magnificent high Andes Mountains where they viewed several volcanoes and spent time in the cloud forests on both the eastern and western slopes. These cloud forest ecosystems provided opportunities to observe entirely different flora and fauna, including the endangered Andean spectacled bear, a new species of frog (recently described by scientists), and one of the most magnificent and rare lizards in the world.

Throughout the expedition, the students engaged in independent research projects, and they spent the rest of the summer analyzing their data and developing reports of their findings. Given the transformational nature of this study abroad course, Drs. Hopkins and Moore hope to continue providing this opportunity in future years. With Virginia Tech's emphasis on "hands" on-minds on" learning, the future for experiential courses like this seems bright!





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Scientists Assist State in Developing Elk Reintroduction Plan



In 2010, the Virginia Department of Game and Inland Fisheries (VDGIF) initiated a 3-year effort to reintroduce elk to Virginia by releasing 75 individuals of the Rocky Mountain subspecies of elk in Buchanan County, one of three counties (also includes Dickenson and Wise Counties) in Southwest Virginia the agency designated as the Elk Restoration Zone. From these efforts, biologists with the agency believe a herd of 150 to 200 elk now roams areas adjacent to the initial release site in Buchanan County. However, because populations of elk also exist nearby in Kentucky, North Carolina, Tennessee, and now West Virginia, individuals from those populations periodically disperse into other portions of Southwest Virginia. Because of the potential for increasing interactions between elk and humans, the Virginia Department of Game and Island Fisheries (VDGIF) recognized the need for having a comprehensive plan in place to guide management of this species.

To fulfill that need, VDGIF reached out to Virginia Tech, seeking assistance in conducting a facilitated public involvement process that identifies and incorporates the perspectives, concerns, and desires relative to elk of a diverse pool of stakeholders from within Southwest Virginia and elsewhere across the Commonwealth. Associate Professor Jim Parkhurst (Principal Investigator) and Research Associate Zachary Hurst (Project Manager), have been

working collaboratively with VDGIF since late 2016 and are nearing completion of their effort to assist the agency to develop a 10-year operational plan for elk, one that incorporates the values, opinions, and attitudes of stakeholders regarding elk and their management. Although the planning effort emphasizes issues, concerns, and desires expressed by those who reside within Southwest Virginia where, over the next 10 years, elk numbers are expected to grow, the plan also establishes guidance for other regions where elk populations might arise.

A variety of public involvement methods were used to engage with and solicit input from the public, including focus group discussions, a statewide telephone survey, and public workshops. A critical component of the planning effort was the creation of and reliance upon a 17-member Stakeholder Advisory Committee (SAC) comprised of individuals who represent important stakes about how elk should be managed. The task of the SAC was to frame broad

goals that reflect the values held by affected parties and establishes a desired management focus for the agency, whereas a Technical Committee composed of VDGIF staff members creates the technical, science-

based objectives and strategies that help achieve those stated goals. Additional review and comment will be solicited from the public on the draft management plan, the results of which will be incorporated before the plan is presented to the Virginia Board of Game and Inland Fisheries for their consideration and adoption. This open public solicitation for comment likely will occur this spring; information about the public comment process and access to the draft plan will be available via the VDGIF's website (www.dgif.virginia. gov/wildlife/elk/management-plan/).

This project represents another in a series of collaborative public involvement planning projects that Dr. Parkhurst, and his now retired colleague Dr. Steve McMullin, has conducted with the VDGIF. Previous efforts include development of species management plans for white-tailed deer, black bear, and wild turkey as well as operational management plans for VDGIF's Wildlife Management Areas (WMAs) and boating access facilities (ongoing).

Third International Workshop on Animal **Biotechnology and its Regulation**





Regulation of Animal Biotechnology

The word "GMO" evokes negative reaction in many people. Yet, twenty years after the first genetically modified (GM) crops were commercialized, the scientific consensus is that these lines have contributed to agricultural sustainability and food security, and most American consumers routinely purchase products with GM plant content. The first GM animal-derived food product – Atlantic salmon expressing an introduced growth hormone gene - was marketed in Canada last summer. Other lines of GM animals are in the R&D or regulatory pipelines, each posing its own combination of benefits, risks, and public perception and regulatory issues. How will governments reach defensible decisions regarding products as diverse as disease-resistant livestock. reproductively-sterile mosquitos, and omega-3 fatty acidfortified milk? While some countries have the capacity to oversee regulatory oversight and commercialization of GM animal products, some do not. Given high levels of trade in agricultural products, trading partners need to harmonize their biotechnology regulatory policies. Thirty-eight countries have approved at least some GM agricultural products, and many more may yet approve production or import. Hence, there is a global need for building biotechnology regulatory capacity.

This capacity-building need was addressed in the Third International Workshop for Regulation of Animal Biotechnology held in Charlottesville, Virginia, from June 26-30, 2017. The workshop convened 146 attendees from 38 countries, including 93 regulators from 35 countries, academics, representatives from leading biotechnology companies, and professionals from non-governmental organizations. Its goal was to advance science-based regulation and decision-making processes and to promote harmonized regulations for animal biotechnologies globally. Workshop sessions were designed to strengthen the capacity of countries. especially in the developing world, to create and implement regulations enabling safe products of animal biotechnology to reach the market and help address challenges facing animal agriculture globally.

The workshop was organized by a committee cochaired by Eric Hallerman and Diane Wray-Cahen (U.S. Department of Agriculture – Foreign Agriculture Service). Other members included William Hallman (Rutgers University), Hellen Mbaya Kajuju (Kenyan National Biosafety Authority), Yanina Petracca (Argentine Ministry of Agroindustry), S.R. Rao (Indian Ministry of Science and Technology), Mark Walton (Mark Walton Enterprises, LLC), and Bruce Whitelaw (Roslin Institute, UK). The organizing committee secured sponsorships from the U.S. Departments of Agriculture and State, Biotechnology Innovation Organization, Genus PLC, Intrexon, and Yorktown Technologies. The Bill and Melinda Gates Foundation supported the travel and attendance of 30 regulators from Africa and Asia.

The workshop opened with sessions on animal breeding and biotechnologies for key livestock animals. Traits of interest vary; for large mammals, key traits include polled (hornless), double muscling, and heat tolerance; for poultry, disease resistance and pre-hatch sexing for layers; for aquaculture species, growth and disease resistance;

and for insects, biological control and production of novel silk products. A key theme was developing a shared sense of how animal biotechnology might best be applied in developing countries where key interests are disease resistance, heat stress tolerance, and tolerance of poor forage.

The regulatory regime in a given country has a

large bearing on the likelihood that a product of animal biotechnology will be approved. Regulatory approaches in different countries vary widely. Regulators broke out into groups representing Africa, Latin America, Asia, or the rest of the world to discuss regional oversight issues. Each group drafted a regional biotechnology strategy paper to be further developed in follow-up to the workshop.

Developers from academia and industry shared the perspective that what they want most from regulatory frameworks is a system that is predictable, timely, and encourages innovation. Regulations developed for crop biotechnology do not work well for oversight of animal biotechnology. Despite ongoing efforts, the integration of innovation and regulation in the biotechnology sector is not yet well achieved.

For society to embrace animal biotechnology, it must perceive benefits and believe that any risks are understood and managed. This can be addressed by effective application of principles of risk assessment, management, and communication, especially for food and environmental risks. Ethical considerations suggest that applications of animal biotechnology should produce a

net balance of benefits over harms and costs, and should distribute benefits, harms and other costs fairly. Effective communication with multiple publics, including government officials and sectors of the general public, is critical. Among case studies to draw upon are dissemination of GM crops in Africa and GM mosquitos to contain the



spread of Zika virus in Brazil and Florida. Approximately 100 people participated in exercises to develop effective communications skills.

Workshop material is available online at (https:// sites.google.com/a/vt.edu/ animalbiotechresources/thirdannual-2017). As the workshop closed, participants expressed enthusiasm and energy around animal biotechnologies. They

asked for continued interaction with other participants, especially to encourage regional and global exchange of information to promote harmonization of regulatory approaches. The real impact of the workshop, however, will be realized in the future, as countries may choose to adopt well-chosen animal biotechnologies to address animal production issues.

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NEW FACES IN THE DEPARTMENT



Dr. Ashley Dayer

Dr. Ashley Dayer joined the College in the Department of Fish and Wildlife Conservation as an Assistant Professor in fall 2016. Dr. Daver is a conservation social scientist and comes to us from a Visiting Assistant Professor position at SUNY College of Environmental Science and Forestry and a Research Associate position at Cornell University, Department of Natural Resources, Human Dimensions Research Unit. Dr. Dayer has taught a graduate course titled "Social Survey Research Methods for Environmental Issues" and guided independent study experiences for undergraduate students in human dimensions research. Dr. Dayer completed her B.A. in Environmental Science & Public Policy at Harvard University and her M.S. in Human Dimensions of Natural Resources at Colorado State University. The title of Dr. Dayer's dissertation was "Advancing the study of private landowner behavior: Understanding early successional forest habitat management" and was completed at Cornell University. Dr. Dayer's dissertation research examined the effectiveness of New York State Department of Environmental Conservation activities to encourage landowner management for early successional forest habitat.

Dr. Mike Cherry

Dr. Mike Cherry joined the College in the Department of Fish and Wildlife Conservation as an Assistant Professor in fall 2016. Dr. Cherry is an applied vertebrate ecologist and comes to us from a Postdoctoral Research Scientist position at Jones Ecological Research Center in Georgia where he coordinated the South Florida Deer Study examining the interactions between white-tailed deer and Florida Panthers in southern Florida. Dr. Cherry also holds an Adjunct Assistant Professor position at the University of Georgia and has co-instructed courses in Field Methods in Wildlife Health, Management, and Research, and Physiology and Nutrition. Dr. Cherry completed a Bachelor of Science in Forest Resources with a major in Wildlife Management at the University of Georgia. As an undergraduate Dr. Cherry was the Facility Foreman at the Whitehall Deer Research Facility and oversaw the care of a captive deer herd. He also was recognized as the Wildlife Student of the Year in the Warnell School of Forestry and Natural Resources in 2010. Dr. Cherry also completed his Ph.D. in Wildlife Ecology and Management at UGA; the title of his dissertation was: "Deer, Coyotes, and the Ecology of Fear in a Longleaf Pine Savanna." His dissertation examined the direct and indirect effects of coyotes on white-tailed deer in southwestern Georgia.



Dr. Luis Escobar

Dr. Luis Escobar joined the College in the Department of Fish and Wildlife Conservation in fall 2017 and comes to us from a Research Associate position at the University of Minnesota. Dr. Escobar is trained broadly in veterinary science, wildlife management, and disease ecology. He holds a M.A. in Veterinary Science, a M.S. in Wildlife Management, a Doctor of Veterinary Medicine, and a Ph.D. in Conservation Medicine. Dr. Escobar was the first faculty member hired as part of the Global System Sciences Destination Area. Dr. Escobar is interested in disease ecology in general, and the application of niche modeling to understanding the spread and virulence of disease in wildlife and humans. His dissertation focused on the disease biogeography of rabies. Dr. Escobar has an international set of collaborators and has worked in at least 10 countries from North and South America to China and Australia.







Dr. Marcella Kelly's international work was recognized with the 2017 Alumni Award for Excellence in International Research. The award. presented by the Virginia Tech Alumni Association, recognizes faculty who's sustained work has contributed significantly to the internationalization of Virginia Tech through global impacts. Nominators wrote of Dr. Kelly's work: "Dr. Kelly has established an internationally recognized research program that is contributing to the conservation of biological diversity abroad as well as here in the commonwealth. The impacts of that research program on students from Virginia Tech and from the host countries are clear. Ultimately, the results of Dr. Kelly's research are better conservation now and the training of the next generation of conservation professionals in the countries where she works." Dr. Kelly's international work has also been recognized by the Philadelphia Zoo with the Global Conservation Leader of the Year award in 2013.

Dean Stauffer

Dr. Dean Stauffer was recognized for his long career and dedication to teaching and student success with the William E. Wine Award here on campus and an Excellence in Wildlife Education Award from The Wildlife Society at its annual national meeting in Albuquerque this past September. The William E. Wine Award was established in 1957 by the Virginia Tech Alumni Association in memory of William E. Wine, Class of 1904, who was a former rector of the Board of Visitors and Alumni Association president. The Excellence in Wildlife Education Award is given to faculty who exhibit exemplary teaching and contribute to the improvement of wildlife education for undergraduate and graduate students. Nominators wrote of Dr. Stauffer: "While recognizing the individual learning styles and challenges of each student, Dr. Stauffer maintains high expectations and rigor in his courses. Ultimately, Dr. Stauffer's genuine interest in student success and an atmosphere of rigor and high expectations serve to motivate students."

Faculty's International Impact, Dedication to Teaching and Student Success, and Service to **Professional Societies Recognized**

1000

Donald Orth

Castello is a Pew Marine Fellow



The past work of Dr. Leandro Castello focused on incorporating the knowledge of fishers into fisheries management efforts in large South American rivers. This approach has been quite successful and Dr. Castello is taking this approach to marine systems as part of a Pew Marine Fellowship he received from the Pew Charitable Trusts in 2017. Dr. Castello was one of 11 investigators awarded a fellowship in 2017 and the only one from an American institute. Dr. Castello's work will focus on developing, implementing and evaluating cost-effective ways of generating data on catch rates and other fisheries-related information. The work will take place in Brazil and will develop a better understanding of fisher's knowledge of catch rates. The product of the work will be a handbook of practical guidelines and best practices for fishers and governmental staff. It is hoped that ultimately fishers can work with governmental officials to develop their own catch rate data and incorporate it into management practices.



At the Annual American Fisheries Society (AFS) meeting in Tampa, Florida, Dr. Donald Orth was recognize with an Excellence in Fisheries Education Award and named an AFS Fellow. Dr. Orth joined two other fisheries faculty as AFS Fellows, Drs. Hallerman and Murphy. The fellowship recognizes Don's over 40 years of membership and service to the society, including serving on the Education Subcommittee for the Board of Professional Certification, as chair of the Program Committee, as chair of the Excellence in Fisheries Education Award Committee, and as president of the Education Section. The Excellence in Fisheries Education award recognizes Don commitment to teaching and to the success of students. Don is an innovator in and out of the classroom. Check out his article on use of social media to empower fisheries students via learning networks in the March issue of Fisheries (https:// doi.org/10.1002/fsh.10034).

ALUMNI NEWS Nathaniel (Than) P. Hitt Honored as **Recipient of the Presidential Early** Career Award for Scientists and Engineers (PECASE)

January 09, 2017 - Fish and Wildlife Conservation alumnus Than Hitt ('07 Ph.D. fisheries and wildlife sciences), a Research Fish Biologist at the U.S. Geological Survey's (USGS) Leetown Science Center in Kearneysville, West Virginia, was named one of President Obama's 102 recipients of the Presidential Early Career Awards for Scientists and Engineers (PECASE), the highest honor bestowed by the United States Government on science and engineering professionals in the early stages of their independent research careers.

The awards, established by President Clinton in 1996, are coordinated by the Office of Science and Technology Policy within the Executive Office of the President. Awardees are selected for their pursuit of innovative research at the frontiers of science and technology and their commitment to community service as demonstrated through scientific leadership, public education, or community outreach.

"It's an honor to be selected for this award," Hitt said. "I hope that my research is making a difference for fish ecology and conservation in Appalachia."

Dr. Paul L. Angermeier, Professor and Assistant Unit Leader with the VA Cooperative Fish & Wildlife Research Unit, chaired Hitt's doctoral committee.

"Than brings remarkable passion and insight to his research in fish ecology, with an eye toward using scientific knowledge to advance conservation," said Angermeier.

"From very early in his career as a grad student to his current projects, he continues to excel at formulating timely questions and hypotheses,



then designing instructive studies to address them. His winning the 2017 Presidential Early Career Award reflects the same abilities and work ethic that led to his outstanding performance as a graduate student here."

Hitt holds a B.A. in Biology from the College of Wooster, an M.S. in Organismal Biology and Ecology from the University of Montana, and a Ph.D. in Fisheries and Wildlife Sciences from Virginia Tech. His research investigates freshwater fish ecology and community ecotoxicology from a landscape perspective, focusing on stream ecosystems in the Appalachian highlands.

Than Hitt was the second FWC alum to receive the prestigious award. James L. Thorson ('09 M.S. fisheries and wildlife sciences) was named a PECASE recipient in 2016.

> "Than brings remarkable passion and insight to his research in fish ecology, with an eye toward using scientific knowledge to advance conservation"

Austen Receives Gerald H. Cross Award

Dr. Douglas J. Austen ('84 M.S. fisheries and wildlife sciences) is the 2016 winner of the Gerald H. Cross award. The Cross Award recognizes alumni of the Department of Fish and Wildlife Conservation for their contributions to leadership within their professions. Students of the College Leadership Institute select the recipient of this award from among nominations by faculty, staff, and students.

Dr. Austen completed a B.S. degree at South Dakota State University before coming to Virginia Tech. At Virginia Tech, under the direction of Dr. Don Orth, Dr. Austen completed research comparing Smallmouth Bass populations between Virginia and West Virginia sections of the New River. The goal of the research was to evaluate minimum length limits that were in place in Virginia, but not in West Virginia. Following his M.S. degree, Dr. Austen completed a Ph.D. at Iowa State University investigating biogeographic variation in fish assemblage structure among lakes of Illinois and emphasizing the importance of the guild concept to fisheries research and management.

After serving as a fisheries researcher and administrator with the Illinois Department of Conservation, Dr. Austen accepted

the director position for the Pennsylvania Fish and Boat Commission, where he served from 2004 to 2010 and played a role in development of the National Fish Habitat Partnership (http://www.fishhabitat.org/). In 2010 Dr. Austen moved to the position of national coordinator of the Landscape Conservation Cooperatives with the U.S. Fish and Wildlife Service. He is currently the executive director of the American Fisheries Society.

Dr. Austen is part of a long line of leadership of the American Fisheries Society (AFS), including four past presidents, the current president, and a current second vice president. As Dr. Steve McMullin assumed the presidency of the society at last year's annual meeting in Tampa, Dr. Brian Murphy was elected second vice president (The second vice president serves a year before becoming the first vice president for a year, then president elect for a year, and then finally president.). As if getting four years of service out of you is not enough, presidents serve a one-year term as past president.



Department of Fish and Wildlife Conservation Alumni at the 2017 American Fisheries Society meeting in Tampa, Florida. From left to right: Chris Kohler (AFS president 2005-2006), Barbara Knuth (AFS president 2004-2005), Steve McMullin (current AFS president), Larry Nielsen (AFS president 1990-1991), Brian Murphy (AFS second vice president), Doug Austen (executive director). Not pictured, but also an AFS past-president is Wayne Hubert (2010-2011).

The Mudbass Classic Fishing Tournament: A Spring Tradition at Virginia Tech

By Corbin Hilling (Ph.D. student, fisheries and wildlife sciences)

Every spring since the early 1980s, anglers young and old have converged on the western part of Virginia Tech's campus with fishing rods in hand. For a few hours, these enthusiastic fishers experience the joy, frustration and bounty of the Mudbass Classic. The Mudbass Classic is an annual fishing event hosted by the Virginia Tech Chapter of the American Fisheries Society (VTAFS) at the Duck Pond on the Blacksburg Campus. The Mudbass Classic provides an opportunity for anglers to test their fishing skills or try fishing for the very first time. The event is targeted towards younger anglers, but anglers of all ages are welcome. The purpose of the event is to stimulate enthusiasm for fishing and outdoor recreation, as well as promote awareness of aquatic resources.

You may be familiar with the Largemouth Bass or Striped Bass, but may be unfamiliar with the "mudbass." Mudbass is another name for the Common Carp, a large-bodied, golden fish with short catfish-like barbels. Despite their large size and "whiskers," Carp are more closely related to a large group of species we call "minnows." Common Carp is a nonnative species in North America, introduced in the late 1800s in response to lobbying by European immigrants. The species is known for its tolerance of modified aquatic habitats, where flow and sediment dynamics have been altered by human activities. Consequently, while watershed urbanization and stream

modifications likely resulted in the extirpation of many stream fishes from sections of Strouble's Creek, the creation of the Duck Pond provided suitable habitat for the Common Carp.

The Mudbass Classic was founded in 1983 by Don Hershfeld, a master's student working under Dr. Donald Orth. Hershfeld, an avid fisherman, sought a fishing spot close to campus when he discovered the Duck Pond and its population of mudbass. He quickly learned mudbass fishing is not an easy endeavor and experimented with specialized gear. After some ridicule from fellow students for not pursuing a more prestigious sport fish, Hershfeld challenged them to a carp fishing competition. Hershfeld molded the friendly competition into a fishing tournament with 40+ entrants. The event has continued on an annual basis, providing generations of anglers an opportunity to chase the elusive mudbass. in addition to other members of the Duck Pond fish community.

The 35th Annual Mudbass Classic Fishing Tournament was held April 28, 2018 at the Virginia Tech Duck Pond. While the event began as a fishing competition, the Mudbass Classic has become a fun, family-friendly event for both children and adults to enjoy. The Mudbass Classic features awards for largest and smallest mudbass, as well as most mudbass caught. In addition, VTAFS and the event's generous sponsors provided prizes for around the world. MUDBASS TOURNAMEN

biggest fish of several other species, including

However, VTAFS generally has something to

offer all youth participants. Fishing gear was

provided by VTAFS for those who needed it

and volunteers helped inexperienced anglers learn the basics. In addition, VTAFS had a

tank of local fishes on display. This annual

event has become an important tradition for

persist long into the future to showcase the

the Virginia Tech community and will hopefully

enjoyable sport of fishing and the importance

of fishes to our lives and aquatic ecosystems

catfish, sunfish, and Largemouth Bass.

Former VTAFS President Hae Kim ('17 B.S. fish conservation) poses for a photograph during the setup for the 33rd Annual Mudbass Classic.

The 35th Annual Mudbass Classic was held April 28, 2018 at the Virginia Tech Duck Pond.

UG AWARDS & RECOGNITION

Scholarships & Awards

Alumni Award for Outstanding Senior (FWC) John Connock (B.S. wildlife conservation)

David Wm. Smith Leadership Award Matthew Lacey (B.S. wildlife conservation)

Thomas M. Brooks Scholarship Rasha Aridi (B.S. wildlife conservation)

William M. Carter Memorial Scholarship Clay Ferguson (B.S. fish conservation)

CNRE Honors Endowment Fund Deirdre Conroy (B.S. wildlife conservation) Emily Reasor (B.S. wildlife conservation) Lindsay Wentzel (B.S. wildlife conservation)

A.E. "Jim" Evans Scholarship Samantha Price (B.S. wildlife conservation)

Gray Lumber Company Scholarship Julianna Duran (B.S. wildlife conservation) Tiffanie Pirault (B.S. wildlife conservation)

Mr. and Mrs. Thomas C. Newbill Scholarship Kyle Bidwell (B.S. wildlife Conservation)

> Jack Sheldon Scholarship Niall Goard (B.S. fish conservation)

Union Camp Scholarship Rasha Aridi (B.S. wildlife conservation) Timothy Calhoun (B.S. wildlife conservation)

Bevond Boundaries Scholarship Caroline Ilse (B.S. wildlife conservation) George Wenn (B.S. wildlife conservation) Patrick Wicklein (B.S. fish conservation)

Class of 1952 Scholarship Rebecca Belcher (B.S. wildlife conservation) Cole Reeves (B.S. fish conservation)

Kathryn M. Fabrycky Memorial Scholarship Cantley Krafft (B.S. fish conservation)

Robert H. Giles Jr Scholarship Courtney Whisenant (B.S. wildlife conservation)

Henry S. Mosby Scholarship Jessica Fitzpatrick (B.S. wildlife conservation) Aylett Lipford (B.S. wildlife conservation) Paul Weiss (B.S. fish conservation) Nena Whaley (B.S. wildlife conservation)

Martha Pennington Orth Memorial Scholarship Samantha Wilson (B.S. wildlife conservation)

Michael B. Wagner Memorial Scholarship Brittany Vicars (B.S. wildlife conservation)

Camp-Younts Foundation Scholarship in Wildlife Deirdre Conroy (B.S. wildlife conservation) Amie Scott (B.S. wildlife conservation) Lindsay Wentzel (B.S. wildlife conservation)

An impressive Common Carp caught during the 33rd Annual Mudbass Classic in 2016. Photo by Jason Emmel.



Ambassadors for 2017-2018

Jules Duran (B.S. wildlife conservation) Olivia Fox (B.S. wildlife conservation) Jackson Helling (B.S. wildlife conservation) Jill Sower (B.S. wildlife conservation) Lindsay Wentzel (B.S. wildlife conservation) Valerie Wessel (B.S. wildlife conservation) Jordan Wheatley (B.S. fish conservation)

FWC CNRE Leadership Institute 2017-2018 Cohort

Alexandra lves (B.S. wildlife conservation) Emily Reasor (B.S. wildlife conservation) Amie Scott (B.S. wildlife conservation) Samantha Wilson (B.S. wildlife conservation)

GRADUATE AWARDS & RECOGNITION

Scholarships & Awards

A.B. Massey Outstanding Doctoral Student & CNRE Outstanding Doctoral Student Erin Poor H.E. Burkhart Outstanding Master's Student & CNRE Outstanding Master's Student Chelsea Weithman Outstanding Teaching Assistant George Brooks Richard Hunter Cross Jr. Scholarship Samantha Robinson Burd Sheldon McGinnes Graduate Fellowship Erin Heller, Brandon Semel, & Gifty Anane-Taabeah Dwight Chamberlain Wildlife Fellowship Erin Poor & Corbin Hilling Georgia Pacific Dean's Graduate Fellowship Katie McBaine Roanoke Valley Bird Club Scholarship Earle Berge

Recent Theses and Dissertations

Ben Chapman Augustine; Ph.D.; Spring 2018 (Advisor: Marcella Kelly) "Leveraging partial identity information in spatial capture-recapture studies with applications to remote camera and genetic capture-recapture surveys"

Mike Shawn Muthersbaugh; M.S.; Spring 2018 (Advisor: Mark Ford) "Seasonal activity patterns of bats in Western Virginia"

Molly Marie Thompson; M.S.; Spring 2017 (Advisor: William Hopkins) "Individual and interactive impacts of mercury and agriculture on reproduction in a freshwater turtle, Chelydra serpentine"

Sasha Stevely Doss; M.S.; Spring 2017 (Advisor: Brian Murphy) "Managing Muskellunge in the New River, Virginia: Effective regulations and predation on Smallmouth Bass"

Allison Lynn White; M.S.; Spring 2017 (Advisor: Yan Jiao) "Spatial and temporal heterogeneity in life history and productivity trends of Atlantic Weakfish (Cynoscion regalis) and implications to fisheries management"

Lauren Victoria Austin; M.S.; Spring 2017 (Advisor: Mark Ford) "Impacts of fire on bats in the Central Appalachians"

Christopher Brian Rowe; M.S.; Fall 2017 (Advisor: Marcella Kelly) "The influence of habitat features and co-occurring species on puma (Puma concolor) occupancy across eight sites in Belize, Central America"

Anne Winona Hilborn; Ph.D.; Fall 2017 (Advisor: Marcella Kelly) "The effect of individual variability and larger carnivores on the functional response of cheetahs"

Corey Garland Dunn; M.S.; Fall 2017 (Advisor: Paul Angermeier) *"Habitat and imperilment of the Candy Darter Etheostoma osburni in the New River Drainage, USA"*

Student recognized for outdoor photography

Niall Goard, a fish conservation major interested in marine fisheries, is the winner of the 2016-2017 Virginia Outdoor Writers Association-Hunt's Photo-Dominion Resources Best Outdoor Photograph award. Niall's photograph of an ice climber repelling down a glacier was taken during a glaciology course that took him to remote glaciers around the world. The receding glaciers that Niall visited and photographed during the course have inspired his interest in conservation. To complete his requirements for the marine fisheries conservation option he will be studying coral reef ecology and documenting coral declines at the Council on International Educational Exchange research station in Bonaire, Antilles. Niall is a repeat winner; his photograph of "McAfee Knob at Sunset" taken as a freshman won the same prize in the 2015-2016 contest (https://vtnews.vt.edu/articles/2016/05/cnre-essayandphotoawards.html).



Please send information for future issues to lyhayes@vt.edu

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Tara Craig





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A word cloud developed from the titles of 769 fish and wildlife conservation theses and dissertations to date.

