PROGRAM & ABSTRACTS
of the 2024 joint meeting of

THE HELMINTHOLOGICAL SOCIETY OF WASHINGTON

&

THE SOUTHEASTERN SOCIETY OF PARASITOLOGISTS

18–20 April 2024

Virginia Military Institute
Lexington, Virginia

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PROGRAM SUMMARY FOR THE ANNUAL MEETING

Thursday, April 18th

Virginia Military Institute, Center for Leadership & Ethics (CLE)	
Check-in / Late Registration (CLE Foyer)	3:00 – 4:30 PM
HelmSoc Exec. Comm. Meeting (Allegheny room)	3:00 – 5:30 PM
SSP Exec. Comm. Meeting (Shenandoah room)	3:00 – 5:30 PM
Keynote Address (Gillis Theater)	5:30 – 6:30 PM

5:30 **The Challenging and Complex Ecology of Ticks in Southeastern Virginia**. Holly Gaff. Department of Biological Sciences, Old Dominion University, Norfolk, VA USA.

Social & Appetizers (Hall of Valor)	6:30 – 8:00 PM

Friday, April 19th

Continental Breakfast (Hall of Valor)	7:00 – 8:00 AM
Paper Session I (papers #1 thru #16) (Gillis Theater)	8:00 – 12:15 PM
Lunch (Hall of Valor)	12:15 – 1:00 PM
Poster Session (posters #1 – #15) (Hall of Valor - balcony)	1:00 – 2:00 PM
Paper Session II (papers #17 – #32) (Gillis Theater)	2:00 – 6:15 PM
(a break from 4:00-4:30 coincides with a nearby military parade!)	
Dinner Banquet w/ buffet, music, dancing (Hall of Valor)	6:30 – 10:30 PM

Saturday, April 20th

Continental breakfast (Hall of Valor)	7:00 – 8:00 AM
Paper Session III (papers #33 – #48) (Gillis Theater)	8:00 – 11:45 AM
Lunch + HelmSoc business meet. (Shenandoah room)	12:00 – 1:30 PM
Lunch + SSP business meeting (Hall of Valor)	12:00 – 1:30 PM

Information for speakers & poster presenters: If presenting an oral presentation, *please load your presentation file before your session begins.* If presenting a poster, you may set up your poster on the tables with easels on the balcony overlooking the Hall of Valor any time after check in on Thursday.

KEYNOTE ADDRESS
Thursday, April 18th **5:30 PM – 6:30 PM**
Location: Gillis Theater
Moderator: **Elizabeth Gleim**

5:30 **The challenging and complex ecology of ticks in Southeastern Virginia.** Holly Gaff. Department of Biological Sciences, Old Dominion University, Norfolk, VA.

PAPER SESSION I
Friday, April 19th **8:00 AM – 12:15 PM**
Location: Gillis Theater
Moderators: **Brett Warren** & **Steve Ksepka**
Key: Presenting Author; **@**Judith Humphrey Shaw Student Award competitor (undergraduate student); **#**Stirewalt-Lincicome Student Award competitor (graduate student); **†**Ciordia-Stewart-Porter Undergraduate Paper Competitor (undergraduate student); **‡**Byrd-Dunn Graduate Student Paper Competitor (graduate student)

‡8:00 1. **Supplemental description of *Caballerotrema annulatum* (Diesing, 1850) Ostrowski de Núñez and Sattmann, 2002 (Digenea: Caballerotrematidae) from a new host (*Electrophorus* cf. *varii*) and locality (Amazon River, Colombia) with phylogenetic analysis and emended generic diagnosis.** Cajiao-Mora, Kamila, John H. Brule, Haley R. Dutton, and Stephen A. Bullard. Southeastern Cooperative Fish Parasite and Disease Laboratory, School of Fisheries, Aquaculture, and Aquatic Sciences, Auburn University, Auburn, AL.

†8:15 2. **Exploring phylogenetic relationships between *Ostertagia* nematodes.** Smith, Catherine A[1], Elizabeth Kurimo-Beechuk[1], Mark G. Ruder[1], Kayla B. Garrett[1], Ethan P. Barton[1,2], and Michael J. Yabsley[1]. [1]University of Georgia, Athens, GA USA and [2]West Virginia Department of Natural Resources, Romney, WV.

†8:30 3. **Gut secrets of raccoons: unveiling enigmatic new species of *Alaria.*** Young, Maggie A.[1], Sarah A. Orlofske[2], Robert C. Jadin[2], Stephen E. Greiman[3], Vasyl V. Tkach[4], and Tyler J. Achatz[1]. [1]Middle Georgia State University, Macon, GA; [2]University of Wisconsin-Stevens Point, Stevens Point, WI; [3]Georgia Southern University, Statesboro, GA; and [4]University of North Dakota, Grand Forks, ND.

#8:45 4. **Host specificity in hookworms: species-specific and sex-dependent immune mechanisms mediate host permissiveness.** Langeland, Andrea, Elise L. McKean, Catherine A. Jackson, Damien M. O'Halloran, and John M. Hawdon. George Washington University, Washington, DC.

#9:00 5. **Distribution and population genetics of recently rediscovered aspidogastreans and their snail hosts in Eastern United States river ecosystems.** Hall-Stratton, Daya L.[1], Amy E. Fowler[1], and April M. H. Blakeslee[2]. [1]George Mason University, Fairfax, VA and [2]East Carolina University, Greenville, NC.

@9:15 6. ***Tribolium confusum* beetles show attraction to some, but not all, acids found in the feces of rats infected with the tapeworm *Hymenolepis diminuta*.** Kirkland, Jenna D.[1], Katherine Orndorff[1], Roger Ramirez Barrios[2], Anne C. Jones[2], Mason C. Martin[2], Tappey H. Jones[1], and Ashleigh B. Smythe[1]. [1]Virginia Military Institute, Lexington, VA and [2]Virginia Polytechnic Institute and State University, Blacksburg, VA.

‡9:30 7. **Two and a half centuries of morphological mishaps within *Axine* Abildgaard, 1794 (Monogenoidea: Axinidae Monticelli, 1903): new observations of type specimens, description of a putative innominate species, and (finally) a tree that includes an axinid sequence.** Brule, John H., Micah B. Warren, and Stephen A. Bullard. Southeastern Cooperative Fish Parasite and Disease Laboratory, School of Fisheries, Aquaculture, and Aquatic Sciences, Auburn University, Auburn, AL.

@9:45 8. **The beetle *Tenebrio molitor* shows attraction to some, but not all, acids found in the feces of rats infected with the tapeworm *Hymenolepis diminuta*.** Orndorff, Katherine[1], Jenna D. Kirkland[1], Roger Ramirez Barrios[2], Anne C. Jones[2], Mason C. Martin[2], Tappey H. Jones[1], and Ashleigh B. Smythe[1]. [1]Virginia Military Institute, Lexington, VA and [2]Virginia Polytechnic Institute and State University, Blacksburg, VA.

10:00 – 10:15 **BREAK**

Moderators: **Katrina Lohan & Amy Fowler**

#10:15 9. **The use of lectins and fluorescence microscopy to reveal carbohydrate arrangements on *Brugia malayi* anatomy.** Pritts, Mariah E. and Rebekah T. Taylor. Frostburg State University, Frostburg, MD.

#10:30 10. **Parasites of the eastern Everglades, Florida fishes: Bangham 1940 revisited.** Sawickij, Katerina[1], Christopher Blanar[2], Matthew J. Hoch[2], David Kerstetter[2], and Florian Reyda[1]. [1]State University of New York at Oneonta, Oneonta, NY and [2]Nova Southeastern University, Davie, FL.

†10:45 11. **Helminth communities of invasive lizards in the Ocala National Forest.** Boothe, Abigail[1], Michael Brennan[1], Jenna Palmisano[2], Anna Savage[2], and Stephen E. Greiman[1]. [1]Georgia Southern University, Statesboro, GA and [2]University of Central Florida, Orlando, FL.

†11:00 12. **Surveillance for ticks on outdoor workers in urban parks in Madrid, Spain.** Richmond, Kevin C.[1], Eva Banda[2], José I. Aguirre[2], Sonia M. Hernandez[1,3], and Michael J. Yabsley[1,3]. [1]Southeastern Cooperative Wildlife Disease Study, Department of Population Health, College of Veterinary Medicine, University of Georgia, Athens, GA; [2]Departamento de Biodiversidad, Ecología y Evolución, Universidad Complutense de Madrid, Spain; and [3]Warnell School of Forestry and Natural Resources, University of Georgia, Athens, GA.

#11:15 13. **Past vs. present: a survey of the fish parasites of the tributaries of Oneida Lake, New York.** Whitcomb, Hannah G. and Florian Reyda. State University of New York at Oneonta, Oneonta, NY.

‡11:30 14. **Cestode diversity of *Sorex* Shrews (Eulipotyphla: Soricidae) from Mongolia.** Ahmed, Rokeya[1], Joseph A. Cook[2], Bryan S. McLean[3], Kurt Galbreath[4], and Stephen E. Greiman[1]. [1]Georgia Southern University, Statesboro, GA; [2]University of New Mexico, Albuquerque, NM; [3]University of North Carolina Greensboro, Greensboro, NC; and [4]Northern Michigan University, Marquete, MI.

†11:45 15. **Sucking lice parasitizing small mammals in Mongolia.** Pickeral, April C.[1], Lance A. Durden[1], Stephen E. Greiman[1], Joseph A. Cook[2], and Bryan S. McLean[3]. [1]Department of Biology, Georgia Southern University, Statesboro, GA; [2]Museum of Southwestern Biology and Department of Biology, University of New Mexico, Albuquerque, NM; and [3]Department of Biology, University of North Carolina Greensboro, Greensboro, NC.

†12:00 16. **Thermal imaging as a tool to facilitate diagnosis of equine protozoal myeloencephalitis.** Shiveler, Lauren B. and Gabriel J. Langford. Florida Southern College, Lakeland, FL.

12:15 – 1:00 PM LUNCH (Hall of Valor)

POSTER SESSION
Friday, April 19th **1:00 PM – 2:00 PM**
Location: Hall of Valor Balcony
Key: Presenting Author; **@**Judith Humphrey Shaw Student Award competitor (undergraduate student); *****competing in best poster competition(s); **€**HelmSoc undergraduate student; **#**HelmSoc graduate student; **†**SSP undergraduate student; **‡**SSP graduate student.

*†P1. **The southern expansion of Lyme disease: examining pathogen dynamics in southwestern Virginia.** Aguirre, Aliya C., Leemu K. Jackson, and Elizabeth R. Gleim. Hollins University, Roanoke, VA.

*#P2. **A deeper look at hooks: Inter-relationships among neoechinorhynchid acanthocephalans.** Fleming, Morgan B. and Florian B. Reyda. State University of New York at Oneonta, Oneonta, NY.

*†P3. **You Are What You Eat: Using molecular tools to study tapeworm life cycles in young-of-the-year bull sharks *Carcharhinus leucas*.** Kennedy, Molly A., Allison Durland-Donahou, Melanie Langford, and Gabriel J. Langford. Florida Southern College, Lakeland, FL

*@€P4. **Parasite prevalence and intensity in crab and shrimp hosts in two rivers of the Chesapeake Bay.** Khan, Amani F.[1], Amy E. Fowler[1], April Blakeslee[1], Kiersten Jewell[2], and Sarah R. Goodnight[1]. [1]George Mason University, Fairfax, VA; [2]East Carolina University, Greenville, NC.

*@€P5. **Investigating *Ancylostoma caninum* growth rate in anthelmintic resistant and non-resistant strains.** Krawczyk, Elodie G., Hajar Errahmani, Catherine A. Jackson, Elise L. McKean, and John M. Hawdon. The George Washington University, Washington, DC.

*@**†**P6. ***Sarcocystis* incidence and distribution among *Canis latrans* in Eastern Illinois.** Nuss, Faith J. and Elliot A. Zieman. Eastern Illinois University, Charleston, IL.

*‡#P7. **Deciphering avian foraging behavior with parasite infracommunities.** Olsen, Ellie C., Kate L. Sheehan, and Cody J. Rowden. Frostburg State University, Frostburg, MD.

*‡P8. **Prevalence of *Trypanosoma cruzi* in raccoons (*Procyon lotor*) and its associated risk to humans in central Illinois.** Onuselogu, Ozioma E. and Elliot A. Zieman. Department of Biological Sciences, Eastern Illinois University, Charleston, IL.

*†P9. **Great Egret foraging habits from trophically transmitted endoparasites.** Rowden, Cody J., Kate L. Sheehan, and Ellie C. Olsen. Frostburg State University, Frostburg, MD.

*@€P10. **Finding Dory (*Neoechinorhynchus doryphorus*): Van Cleave and Bangham's mystery worm rediscovered in the Florida Everglades.** Sawickij, Katerina, Madison Stanley, and Florian Reyda. State University of New York at Oneonta, Oneonta, NY.

P11. ***Curcuma domestica* reverses neurological complications in malaria.** Falade, Mofolusho[1], Amany D. Ladagu[2], and Benson Otarigho[3]. [1]Transylvania University, Lexington, KY; [2]University of Ibadan, Ibadan, Nigeria; and [3]Department of Genetics, MD Anderson Cancer Center, Houston, TX.

P12. **An investigation of genetic diversity across life stages of two trophically transmitted trematode parasites.** Goodnight, Sarah R.[1], April M. Blakeslee[2], and Michael W. McCoy[3]. [1]George Mason University, Woodbridge, VA; [2]East Carolina University, Greenville, NC; and [3]Florida Atlantic University, Fort Pierce, FL.

P13. **Seasonal consumption of microplastics and their impacts on infrapopulations of parasites.** Held, Andrew, R. and Kate L. Sheehan. Frostburg State University, Frostburg, MD.

P14. **Unveiling avian forage habit through parasitic infracommunities: a case study of Great Egrets (*Ardea alba*) in aquaculture environments.** Rowden, Cody J. and Sheehan, Kate L. Frostburg State University, Frostburg, MD.

P15. **Trichomonad disease in wild turkeys (*Meleagris gallopavo*): pathology and molecular characterization of *Histomonas*, *Tetratrichomonas*, *Tritrichomonas* and *Simplicimonas* species.** Adcock, Kayla G.[1], Alisia A. Weyna[1], Michael J. Yabsley[1], Rowen E. Bäck[2], Kayla B. Garrett[1], Kevin D. Niedringhaus[1], Melanie R. Kunkel[1], Heather M. A. Fenton[1], Kevin M. Keel[1], Charlie S. Bahnson[1], Elizabeth Elsmo[1], and Nicole M. Nemeth[1]. [1]University of Georgia, Athens, GA and [2]University of Tennessee, Knoxville, TN.

*@€P16. **On the identity of a problematic set of *Neoechinorhynchus* specimens from buffalo (Catostomidae) from Illinois.** Picozzi, Timothy F., Jessica E. Ozner, and Florian B. Reyda. State University of New York at Oneonta, Oneonta, NY.

PAPER SESSION II
Friday, April 19th **2:00 – 6:15 PM**
Location: Gillis Theater
Moderators: **Kamila Cajiao-Mora** & **John Brule**
Key: Presenting Author; **@**Judith Humphrey Shaw Student Award competitor (undergraduate student); **#**Stirewalt-Lincicome Student Award competitor (graduate student); **†**Ciordia-Stewart-Porter Undergraduate Paper Competitor (undergraduate student); **‡**Byrd-Dunn Graduate Student Paper Competitor (graduate student)

‡2:00 17. **Tales from the feathered frontier: investigating ectoparasite community shifts in seabirds with avian botulism.** Barber, Sonja E. and Kate L. Sheehan. Frostburg State University, Frostburg, MD.

‡2:15 18. **Effects of land management on native lizard helminth communities in Florida.** Brennan, Michael N.[1], Stephen E. Greiman[1], Jenna N. Palmisano[2], Lance D. McBrayer[1], and Anna E. Savage[2]. [1]Georgia Southern University, Statesboro, GA and [2]University of Central Florida, Orlando, FL.

@2:30 19. **SSS-Slippery systematics of slithering snake worms.** Von Holten, Zoe S.[1], Tyler J. Achatz[1], and Vasyl V. Tkach[2]. [1]Middle Georgia State University, Macon, GA and [2]University of North Dakota, Grand Forks, ND.

‡2:45 20. **The endoparasite community of columbids in south Florida, and Eleuthera, Bahamas.** Zaffiro, Briana K.[1], David W. Kerstetter[2], and Christopher Blanar[1]. [1]Department of Biological Sciences, Halmos College of Arts and Sciences, Nova Southeastern University and [2]Department of Marine and Environmental Sciences, Halmos College of Arts and Sciences, Nova Southeastern University.

‡3:00 21. **Parasites of the invasive gray-headed swamphen (*Porphyrio poliocephalus*) in southern Florida.** Hilber, Alexia, David W. Kerstetter, and Christopher Blanar. Department of Marine and Environmental Sciences, Halmos College of Arts and Sciences, Nova Southeastern University.

‡3:15 22. **Metazoan endoparasites of king mackerel (*Scomberomorus cavalla*) as possible biological tags.** Klingler, Charles A., David W. Kerstetter, and Christopher Blanar. Department of Marine and Environmental Sciences, Nova Southeastern University, Fort Lauderdale, FL.

‡3:30 23. **Spatiotemporal prevalence of a parasitic dinoflagellate, *Hematodinium perezi*, in the blue crab, *Callinectes sapidus*, and the water column of the Charleston Harbor Estuary, SC.** Korper, Hannah[1,2], Michael Kendrick[2], Isaure de Buron[1], Greg Rothman[2], and Yong Lengxob[2]. [1]College of Charleston, Charleston, SC and [2]South Carolina Department of Natural Resources, Charleston, SC.

‡3:45 24. **Digenean diversity within bats from the Darien Region of Panama.** Mcfarland, Alex.[1], Joseph A. Cook[2], Jonathan L Dunnum[2], Jocelyn P. Colella[3], and Stephen E. Greiman[1]. [1]Georgia Southern University, Statesboro, Georgia; [2]University of New Mexico, Albuquerque, New Mexico; and [3]University of Kansas, Lawrence, KS.

4:00 – 4:30 **BREAK + Military Parade**

Moderators: **Kate Sheehan** & **Mike Zimmerman**

‡4:30 25. **Island living: *Angiostrongylus cantonensis* is a novel threat to the Florida burrowing owl (*Athene cunicularia floridana*).** Castleberry, Nikole L.[1,6], Håkon Jones[1]; Nicole M. Nemeth[1,2], Brittany Piersma[3], Raul Boughton[4], Rebecca Hardman[4], Lisa A. Shender[4], Kayla B. Garrett[1,5], Teo Hui Xuan[1,2], Rebecca Radisic[1,2], Martha F. Dalton[1,2], and Michael J. Yabsley[1,5,6]*. [1]Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine, University of Georgia, Athens, GA; [2]Department of Pathology, College of Veterinary Medicine, University of Georgia, Athens, GA; [3]Audubon Western Everglades, Naples, FL; [4]Florida Wildlife Commission, Fish and Wildlife Research Institute, St. Petersburg, FL; [5]Warnell School of Forestry and Natural Resources, University of Georgia, Athens, GA; and [6]Center for Ecology of Infectious Diseases, Athens, GA.

‡4:45 26. **A parasite perspective on invasion ecology: Contrasting acanthocephalan infections in native vs. non-native crayfish intermediate hosts.** Rothman, Gregory K.[1,2], Isaure de Buron[1], Kristina M. Hill-Spanik[1], Graham A. Wagner[2], Jordan F. Parish[2], Peter R. Kingsley-Smith[2], and Michael Kendrick[2]. [1]College of Charleston, Charleston, SC and [2]South Carolina Department of Natural Resources, Marine Resources Research Institute, Charleston, SC.

‡5:00 27. **A geographical and molecular analysis of the mosquito vector population in the Cumberland Gap Region.** Williams, Stacie D., Logan Allinson, Emily Williams, Daryel Escandell, Kensey Smartt, and Charles Faulkner. Lincoln Memorial University, Harrogate, TN.

5:15 28. **Another new genus and species of fish blood fluke (Digenea: Aporocotylidae) from a common fish (white mullet, *Mugil curema*) in the Gulf of Mexico, including pathology and phylogenetic analysis.** Micah B. Warren, Steven P. Ksepka, Triet N. Truong, Stephen S. Curran, Haley R. Dutton, and Stephen A. Bullard. Southeastern Cooperative Fish Parasite and Disease Laboratory, School of Fisheries, Aquaculture, and Aquatic Sciences, Auburn University, Auburn, AL.

5:30 29. **Field surveys, comparative parasitology, and laboratory stress tolerance of freshwater introduced mystery snails in the Mid-Atlantic.** Fowler, Amy E.[1], Grace Loonam[1,2], Pratyush Jaishanker[1], Nicholas T. Lewis[1], Daya Hall-Stratton[1], Sarah Goodnight[1], and April M. H. Blakeslee[2]. [1]George Mason University, Fairfax, VA and [2]East Carolina University, Greenville, NC.

5:45 30. **The role of centrachid host diversity on *Posthodiplostomum* spp. infection in bluegill sunfish (*Lepomis macrochirus*).** Zimmermann, Michael R.[1,2] and Madison Upperman[2]. [1]University of Mount Union, Alliance, OH and [2]Shenandoah University, Winchester, VA.

6:00 31. **Investigating the anthelmintic potential of *Momordica charantia* against hookworm infections.** Jackson, Catherine A., Elise L. McKean, Andrea Langeland, and John M. Hawdon. George Washington University, Washington, D.C.

6:15 32. **Pre- and post-infection volatiles in rat feces infected with the tapeworm *Hymenolepis diminuta*.** Jones, Anne C.[1], Roger Ramirez Barrios[2], Mason C. Martin[1], Tappey H. Jones[3], and Ashleigh B. Smythe[4]. [1]Department of Entomology, Virginia Polytechnic Institute and State University, VA; [2]Department of Biomedical Sciences and Pathobiology, VA-MD College of Veterinary Medicine Virginia Polytechnic Institute and State University, Blacksburg, VA; [3]Department of Chemistry, Virginia Military Institute, Lexington, VA; and [4]Department of Biology, Virginia Military Institute, Lexington, VA.

6:30 –10:30 PM **DINNER/ BANQUET (Hall of Valor)**

PAPER SESSION III
Saturday, April 20th **8:15 AM – 12:15 PM**
Location: Gillis Theater
Moderators: **Andrea Angeland** & **Catie Jackson**
Key: Presenting Author

8:00 33. **Did brain-infecting scuticociliates (*Philisterida* sp.) kill wild sharks in the northwestern Atlantic Ocean?** Ksepka, Steven P.[1], Alisa L. Newton[2], and Stephen A. Bullard[1]. [1]Southeastern Cooperative Fish Parasite and Disease Laboratory, School of Fisheries, Aquaculture, and Aquatic Sciences, Auburn University, Auburn, AL 36849 and [2]OCEARCH, Park City, UT.

8:15 34. **Inter- and intra-institutional comparison of the fecal microbiome of *Schistosoma mansoni* infected mice.** Mhanna, Mariam A., David T. Gauthier, and Lisa M. Shollenberger. Old Dominion University, Norfolk, VA.

8:30 35. **Biodiversity differentially impacts disease dynamics across marine and terrestrial habitats.** Pagenkopp Lohan, Katrina M.[1], Sarah A. Gignoux-Wolfsohn[2], and Gregory M. Ruiz[1]. [1]Environmental Research Center, Edgewater, MD 21037 and [2]University of Massachusetts Lowell, Lowell, MA.

8:45 36. **A new genus of Transversotrematidae (Digenea) and first morphological and nucleotide-based confirmation of the life cycle of a transversotrematid in North America.** Truong, Triet N. and Stephen A. Bullard. Southeastern Cooperative Fish Parasite and Disease Laboratory, School of Fisheries, Aquaculture, and Aquatic Sciences, Auburn University, Auburn, AL.

9:00 37. **Warm and cold: seasonal flux of a parasite population in a subarctic lake.** Sheehan, Kate L. Frostburg State University, Frostburg, MD.

9:15 38. **Resolution of some taxonomic problems in *Diplomonorchis* Hopkins, 1941 from coastal USA.** Curran, Stephen S. and Stephen A. Bullard. Southeastern Cooperative Fish Parasite and Disease Laboratory, School of Fisheries, Aquaculture, and Aquatic Sciences, Auburn University, Auburn, AL.

9:30 39. **Highly modified and immunoactive N-glycans of *Dirofilaria immitis* and *Trichuris suis*.** Wilson, Iain B.H.[1], Barabara Eckmair[1], Francesca Martini[2], Richard D. Cummings[3], and Katharina Paschinger[1]. [1]Universität Für Bodenkultur Wien, Austria; [2]ETH Zürich, Switzerland; and [3]Harvard Medical School, Boston.

9:45 40. **Variation in diplostomid parasite infection patterns and pathology in bluegill sunfish (*Lepomis macrochirus*) reproductive morphotypes.** Zimmermann, Michael R.[1,2], Cassidy Wells[2], and Simone Meadows[2]. [1]University of Mount Union, Alliance, OH and [2]Shenandoah University, Winchester, VA.

10:00 – 10:15 **BREAK**

Moderators: **Ash Bullard** & **Steve Curran**

10:15 41. **Invasion of the body snatchers: the role of parasite introduction in host distribution and response to salinity in invaded estuaries.** Blakeslee, April M. H.[1], Darby L. Pochtar[2], Amy E. Fowler[2], Chris S. Moore[1], Timothy S. Lee[1], Mark E. Torchin[3], Whitman A. Miller[4], Gregory M. Ruiz[4], and Carolyn K. Tepolt[5]. [1]Biology Department, East Carolina University, Greenville, NC; [2]Department of Environmental Science and Policy, George Mason University, Fairfax, VA; [3]Smithsonian Tropical Research Institute, Panama City, Panama; [4]Invasion Ecology Lab, Smithsonian Environmental Research Lab, Edgewater, MD; and [5]Biology Department, Woods Hole Oceanographic Institution, Woods Hole, MA.

10:30 42. **Exploring parasite-induced alterations in sociality and behavior in estuarine fishes.** Blanar, Christopher A.[1], Delaney Farrell[1], Hannah Bauman[1], Laura Nicolas[1], and Lauren E. Nadler[2]. [1]Nova Southeastern University, Fort Lauderdale, FL and [2]University of Southampton, Southampton, UK.

10:45 43. **ParasiteBlitz: A fruitful endeavor at Stono Preserve, SC. Part I. Fishes.** de Buron, Isaure[1], Kristina M. Hill-Spanik[1], Maarten PM Vanhove[2], Dakeishla M. Diaz-Morales[3,4], Gregory K. Rothman[5], Simona Georgieva[6], Michael R. Kendrick[5], Nikol Kmentova[2], and Stephen D. Atkinson[7]. [1]College of Charleston, Charleston, SC; [2]University of Hasselt, Hasselt, Belgium; [3]University of Duisburg-Essen, Essen, Germany; [4]University of

Washington, Seattle, WA; [5]South Carolina Department of Natural Resources, Charleston, SC; [6]Bulgarian Academy of Sciences, Sofia, Bulgaria; and [7]Oregon State University, Corvallis, OR.

11:00 44. **Pentastomes in Paradise: *Raillietiella* infections Galapagos tortoises and other hosts in the Galápagos, Ecuador.** Yabsley, Michael J.[1], Andrea Loyola[2], James Flowers[3], Chelsea Drumgoole[3], Elizabeth Walsh[3], Mateo Davila[4], Diego F. Cisneros-Heredia[4], Juan Pablo Muñoz-Pérez[4], Diego Páez- Rosas[4],Kayla B. Garrett[1], and Gregory A. Lewbart[2]. [1]University of Georgia. Athens GA; [2]Dirección Parque Nacional Galápagos, Ecuador; [3]College of Veterinary Medicine, North Carolina State University. Raleigh NC; and [4]Universidad San Francisco de Quito USFQ. Quito, Ecuador.

11:15 45. **Nested subsets in parasite community ecology: Celebrating 30 years of "meh".** Zelmer, Derek A. University of South Carolina Aiken, Aiken, SC.

11:30 46. **Assessing the role of the Pacific oyster *Magallana gigas* as a reservoir host for the dispersal of *Bonamia* (Haplosporida).** Hill-Spanik, Kristina M.[1], Rothkopf, Hannah[1,2], Allan Strand[1], Ryan B. Carnegie[3], James T. Carlton[4], Lucia Couceiro[5], Jeffrey A. Crooks[6], Hikaru Endo[7,8], Masakazu Hori[9], Mitsunobu Kamiya[10], Gen Kanaya[11], Judith Kochmann[12], Kun-Seop Lee[13], Lauren Lees[14], Massa Nakaoka[15], Eric Pante[16], Jennifer L. Ruesink[17], Evangelina Schwindt[18], Åsa Strand[19], Richard Taylor[20], Ryuta Terada[8], Martin Thiel[2],Takefumi Yorisue[22,23], Danielle Zacherl[24], Erik E. Sotka[1]. [1]College of Charleston, Grice Marine Laboratory, Charleston, SC; [2]Michigan State University, East Lansing, MI; [3]Virginia Institute of Marine Science, Gloucester Point, VA; [4]Williams College--Mystic Seaport Coastal & Ocean Studies Program, Mystic, CT; [5]Facultade de Ciencias, Universidade da Coruña, Coruña, Spain; [6]Tijuana River National Estuarine Research Reserve, Imperial Beach, CA; [7]Faculty of Fisheries, Kagoshima University, Kagoshima, Japan; [8]United Graduate School of Agricultural Sciences, Kagoshima University, Kagoshima, Japan; [9]Japan Fisheries Research and Education Agency, Yokohama, Kanagawa, Japan; [10]Tokyo University of Marine Science and Technology, Tokyo, Japan; [11]National Institute for Environmental Studies, Onogawa, Tsukuba, Japan; [12]Institute of Organismic and Molecular Evolution, Johannes Gutenberg University Mainz, Germany; [13]Pusan National University, Republic of Korea; [14]University of California, Irvine, CA; [15]Akkeshi Marine Station, Field Science Center for Northern Biosphere, Hokkaido University, Akkeshi, Hokkaido, Japan; [16]Univ Brest, CNRS, IRD, Ifremer, UMR 6539, LEMAR, Plouzané, France; [17]University of Washington, Seattle, WA; [18]Instituto de Biología de Organismos Marinos (IBIOMAR-CONICET), Puerto Madryn, Argentina; [19]IVL Swedish Environmental Research Institute, department of Environmental Intelligence, Fiskebäckskil, Sweden; [20]University of Auckland, New Zealand; [21]Universidad Católica del Norte, Chile; [22]Institute of Natural and Environmental Sciences, University of Hyogo, Sanda, Hyogo, Japan; [23]Museum of Nature and Human Activities, Hyogo, Sanda, Hyogo, Japan; [24]California State University, Fullerton, CA.

11:45 47. **Otterly diverse - A high diversity of *Dracunculus* species (Spirurida: Dracunculoidea) in North American river otters (*Lontra canadensis*).** Yabsley, Michael J.[1], Kayla B. Garrett[1], Alec T. Thompson[1], Erin K. Box[1], Madeline R. Giner[1], Ellen Haynes[1], Heather Barron[2], Renata M. Schneider[3], Sarah M. Coker[1], James C. Beasley[1], Ernest J. Borchert[1], Renn Tumlison[4], Allison Surf[4], Casey G. Dukes[1], Colleen Olfenbuttel[5], Justin D. Brown[6], Liandrie Swanepoel[1], and Christopher A. Cleveland[1]. [1]University of Georgia, Athens, GA; [2]Clinic for the Rehabilitation of Wildlife, Sanibel, FL; [3]South Florida Wildlife Center, Fort Lauderdale, FL; [4]Henderson State University, Arkadelphia, AR; [5]North Carolina Wildlife Resources Commission, Raleigh, NC; and [6]Pennsylvania State University, University Park, PA.

---------------------------End of scientific program---------------------------

HELM SOC BUSINESS MEETING & LUNCH
Saturday, April 20 **12:00 – 1:30 PM**
Location: Shenandoah Room

SSP BUSINESS MEETING & LUNCH
Saturday, April 20 **12:00 – 1:30 PM**
Location: Hall of Valor

KEYNOTE ADDRESS

The challenging and complex ecology of ticks in Southeastern Virginia. Holly Gaff. Department of Biological Sciences, Old Dominion University, Norfolk, VA.

Dr. Holly Gaff is a Professor in the Department of Biological Sciences at Old Dominion University, where she currently is Department Chair. Dr. Gaff earned her Ph.D. in Mathematics at the University of Tennessee, Knoxville. Dr. Gaff's research interests focus mainly on the ecology of ticks and tick-borne diseases through an active surveillance project and mathematical modeling. Dr. Gaff also holds an honorary appointment at the University of KwaZulu-Natal and works with scientists throughout southern Africa on the challenges of ticks and tick-borne pathogens there.

Tick-borne diseases are on the rise worldwide, and there is a lot of interest to reduce the burden of these diseases. Ticks and tick-borne pathogens are not well studied partly owing to their challenging biology. The dynamics of tick-borne pathogens includes multi-year systems of weather, habitat, and environmental factors plus the availability of hosts required for each life stage. The Old Dominion University Tick Research Team has been tracking tick populations and their related pathogens through an active surveillance project since 2009. The findings of this long-term surveillance project will be discussed in light of the complex ecology of the region and the resulting tick populations.

ORAL PRESENTATION ABSTRACTS

1. **Supplemental description of *Caballerotrema annulatum* (Diesing, 1850) Ostrowski de Núñez and Sattmann, 2002 (Digenea: Caballerotrematidae) from a new host (*Electrophorus* cf. *varii*) and locality (Amazon River, Colombia) with phylogenetic analysis and emended generic diagnosis.** Cajiao-Mora, Kamila, John H. Brule, Haley R. Dutton, and Stephen A. Bullard. Southeastern Cooperative Fish Parasite and Disease Laboratory, School of Fisheries, Aquaculture, and Aquatic Sciences, Auburn University, Auburn, AL.

Herein, we provide a supplemental description of *Caballerotrema annulatum* (Diesing, 1850) Ostrowski de Núñez and Sattmann, 2002 (Digenea: Caballerotrematidae) based on specimens collected from the intestine of an electric eel, *Electrophorus* cf. *varii* (Gymnotidae) captured in the Amazon River (Colombia). This caballerotrematid possess the following morphological features that differentiate it from congeners (*Caballerotrema brasiliense* Prudhoe, 1960; *Caballerotrema aruanense* Thatcher, 1980; and *Caballerotrema piscicola* [Stunkard, 1960] Kostandinova and Gibson, 2001): body surface spines forming contiguous transverse rows, concentric, distributing into posterior body half; head collar lacking projections, narrower than maximum than maximum body width; corner spines clustered; pharynx approximately at level of the corner spines; and testes ovoid and non-overlapping. Based on our results, we revise the diagnosis of *Caballerotrema* Prudhoe, 1960 to include features associated with the shape and distribution of body surface spines, orientation and position of head collar spines, cirrus sac, seminal vesicle, oviduct, Laurer's canal, oötype, vitellarium, and transverse vitelline ducts. We performed Bayesian Inference analyses using the partial large subunit ribosomal (28S) DNA gene to determine the affinity of our specimens among Echinostomatoidea. Our 28S sequence of *C. annulatum* was recovered sister to that of *Caballerotrema* sp. (the only other caballerotrematid sequence available in GenBank) from an arapaima, *Arapaima gigas* (Schinz, 1822) (Arapaimidae) in the Peruvian Amazon. Our sequence of *C. annulatum* comprises the only caballerotrematid sequenced tethered to a morphological description and voucher specimens in a lending museum. The present study is a new host record and new locality record for *C. annulatum*.

2. **Exploring phylogenetic relationships between *Ostertagia* nematodes.** Smith, Catherine A[1], Elizabeth Kurimo-Beechuk[1], Mark G. Ruder[1], Kayla B. Garrett[1], Ethan P. Barton[1,2], and Michael J. Yabsley[1]. [1]University of Georgia, Athens, GA USA and [2]West Virginia Department of Natural Resources, Romney, WV.

Abomasal nematodes commonly infect domestic and wild ruminants across North America, and there is emerging evidence that domestic and wild ruminants can cycle abomasal nematodes and anthelmintic resistance between each other. One genus that commonly infects domestic and wild ruminants, *Ostertagia*, contains several pairings of "major" and "minor" morphotypes that comprise polyphyletic species, but this designation is based primarily on morphological data. Molecular characterization of these polyphyletic species is poor. To examine the validity of the current taxonomic designation for *O. mossi* and *dikmansi*, one such polymorphic pairing, we collected DNA sequences of both morphotypes at the COI and ITS-2 gene targets for haplotype analysis. We collected 17 total sequences, 5 of *O. dikmansi* and 12 of *O. mossi*, and haplotype analysis at both gene targets revealed no separation between each morphotype. This work validates the polymorphic species hypothesis and provides new data on the genetic relationships between two poorly-characterized morphotypes of *Ostertagia*.

3. **Gut secrets of raccoons: unveiling enigmatic new species of *Alaria.*** Young, Maggie A.[1], Sarah A. Orlofske[2], Robert C. Jadin[2], Stephen E. Greiman[3], Vasyl V. Tkach[4], and Tyler J. Achatz[1]. [1]Middle Georgia State University, Macon, GA; [2]University of Wisconsin-Stevens Point, Stevens Point, WI; [3]Georgia Southern University, Statesboro, GA; and [4]University of North Dakota, Grand Forks, ND.

Alaria is a relatively small genus of diplostomids (Digenea: Diplostomidae) that infect the intestines of carnivore mammals. The life cycle of *Alaria* spp. requires amphibian second intermediate hosts; however, snakes, small mammals, and humans may serve as paratenic hosts. Paratenic host pathology occurs due to an unusual mesocercarial stage. Recent study has demonstrated *Pharyngostomoides* and *Parallelorchis*, two diplostomid genera, to be synonyms of *Alaria*. Of the 11 nominal *Alaria* spp., five are known to infect raccoons. Four of the former *Pharyngostomoides* and *Parallelorchis* spp. are exclusively known from raccoons (*Procyon lotor*). The only other *Alaria* species reported from raccoons is *Alaria alata*, the type-species of the genus. However, *A. alata* has only been reported from crab-eating raccoon (*Procyon cancrivorus*) in Brazil, and likely represents a different species. In the present study, we collected representatives of several digenean taxa from raccoons in Georgia, which included numerous *Alaria* spp. individuals. We utilized a combination of ribosomal and mitochondrial gene sequences to explore phylogenetic relationships among members of the genus. Morphological and molecular study revealed the presence of a new *Alaria* sp. in Georgia, which is morphologically similar to former *Pharyngostomoides* spp. Our materials also allowed us to re-evaluate a variety of *Alaria* spp. currently deposited in museums, some with associated DNA sequences. Our study demonstrates that well-studied hosts in the USA may harbor currently unknown digeneans.

4. **Host specificity in hookworms: species-specific and sex-dependent immune mechanisms mediate host permissiveness.** Langeland, Andrea, Elise L. McKean, Catherine A. Jackson, Damien M. O'Halloran, and John M. Hawdon. George Washington University, Washington, DC.

A long-standing question in parasitology is what mediates the host range of a parasite. Specifically, what is the molecular mechanism that determines why a parasite infects hosts that are permissive to infection, but not those that are non-permissive, and conversely, how does a non-permissive host prevent parasite establishment? Hookworms of the genus *Ancylostoma* demonstrate a wide range of host specificities, ranging from the strict specialist A. caninum that can only reliably infect canids, to the generalist *A. ceylanicum* that infects carnivores, humans, and hamsters. Given the broad host range and the ability to infect hamsters, it is surprising that

A. ceylanicum cannot infect closely related rodents like mice. Evidence suggests that immune mechanisms protect mice from hookworm infection. To test this hypothesis, we leveraged two congeneric species that differ in their host specificity to determine whether the immune system regulates permissiveness to hookworm infection. We found that *A. ceylanicum* completes its life cycle in immunodeficient NSG mice, but not in immunocompetent Swiss Webster mice. However, the closely related host specialist *A. caninum* failed to develop in NSG mice. Neither hookworm species could establish in NOD scid mice, which lack T and B cells yet retain a functional innate immune system, suggesting that the innate immune system restricts infection in mice. Female mice, but not male mice, lacking the signal transducer and activator of transcription 6 (STAT6) supported the development of *A. ceylanicum*, suggesting a sex-dependent mechanism operating in this mouse strain. Our findings reveal that host specificity in hookworm infections is governed by a complex interplay of immune responses, which are species-specific and exhibit sex-dependent differences.

5. **Distribution and population genetics of recently rediscovered aspidogastreans and their snail hosts in Eastern United States river ecosystems.** Hall-Stratton, Daya L.[1], Amy E. Fowler[1], and April M. H. Blakeslee[2]. [1]George Mason University, Fairfax, VA and [2]East Carolina University, Greenville, NC.

Invasive species are an increasing concern worldwide as they disrupt native ecosystems and species. The Japanese mystery snail (*Heterogen japonica*) and the Chinese mystery snail (*C. chinensis*), were intentionally transported from Japan and China to North America in ~1911 and ~1892, respectively, to be cultivated for human consumption. Mystery snails are now found throughout the United States. In Northern Virginia and Southern Maryland, we have genetically confirmed the presence of Japanese mystery snails (*H. japonica*). Part of the success of invasive species, such as mystery snails, is the lack of co-evolved enemies and parasites in invaded locations. However, recent work in our lab has found Aspidogastrean trematodes in *H. japonica* (up to 34% infected) and a native snail (*Elimina virginica*) (up to 3% infected) at several riverine sites in Northern Virginia. Aspidogastrea are a subclass of parasitic trematodes that frequently parasitize freshwater mollusks. Morphologically, the parasite appears to be *Aspidogastrea conchicola*, but limited available genetic data and a worldwide distribution suggests a possible species complex. The presence of *A. conchicola* in both native and non-native species also suggests host-switching. For this research we will sample native *E. virginica* and non-native mystery snails at sites along the Eastern United States to identify their parasite diversity, infection rates, and to collect genetic data for both hosts and parasites. This research aims to resolve knowledge gaps for significant host-parasite interactions at multiple scales and further reveal the influence of invasive species and parasites on integral community interactions.

6. ***Tribolium confusum* beetles show attraction to some, but not all, acids found in the feces of rats infected with the tapeworm *Hymenolepis diminuta*.** Kirkland, Jenna D.[1], Katherine Orndorff[1], Roger Ramirez Barrios[2], Anne C. Jones[2], Mason C. Martin[2], Tappey H. Jones[1], and Ashleigh B. Smythe[1]. [1]Virginia Military Institute, Lexington, VA and [2]Virginia Polytechnic Institute and State University, Blacksburg, VA.

It has been known that tenebrionid beetles are attracted to rat feces infected with the tapeworm *Hymenolepis diminuta*. Previous studies indicate that not only are these beetles attracted to infected feces, but these feces contain volatile chemicals that may promote attraction. Volatile chemicals emitted by uninfected and *H. diminuta*-infected rat feces may influence *Tribolium confusum* beetle behavior to help complete the two-host life cycle. The life cycle of the tapeworm *H. diminu*ta involves a rat definitive host that consumes tapeworm cysticercoids that mature into adults in the intestine. Feces from rats then infect the beetle intermediate host. Our prior research identified five volatile chemicals, small acids, present in infected rat feces but not in uninfected feces. Butyric acid was found in the greatest relative amount, but also found were 3-methylbutyric acid, 2-methylbutyric acid, pentanoic acid, and hexanoic acid. Limonene was shown to be present in uninfected feces but not in infected feces. We studied the attraction of

Tri. confusum towards these acids. Trials used 10 beetles starved 24-48 hours that were then placed into an arena with distinct control and acid groups on clean glass coverslips at either end. Beetles were observed at minute intervals for 10 minutes for which group, control or acid, they were located near. A related samples Wilcoxon signed rank test showed a significant attraction of *Tri. confusum* to the 4-acid mixture when limonene was used as the control (p=0.01), though no significant attraction to individual acids. This study is the first to identify volatile chemicals from a tapeworm-infected host and show beetle attraction to particular acids that may enhance the likelihood of lifecycle completion.

7. **Two and a half centuries of morphological mishaps within *Axine* Abildgaard, 1794 (Monogenoidea: Axinidae Monticelli, 1903): new observations of type specimens, description of a putative innominate species, and (finally) a tree that includes an axinid sequence.** Brule, John H., Micah B. Warren, and Stephen A. Bullard. Southeastern Cooperative Fish Parasite and Disease Laboratory, School of Fisheries, Aquaculture, and Aquatic Sciences, Auburn University, Auburn, AL.

We collected a putative innominate species of *Axine* Abildgaard, 1794 (Axinidae) from 2 Atlantic flyingfish, *Cheilopogon melanurus* (Exocoetidae) from the Gulf of Mexico. Specimens were fixed properly for morphology and preserved in 95% EtOH for *28S* sequencing. A literature review of *Axine* spp. (1794–2023) revealed unanimous misinterpretation of the female accessory canal as comprising the vaginal duct. We studied type and newly collected specimens and concluded that the vaginal duct of *Axine* spp. is separated from the accessory canal and subdivided into distal and proximal portions demarcated by a constriction. The distal vagina comprises a spermatophore chamber and a follicular chamber whereas the proximal vagina comprises a glandular chamber. Our specimens differed from all congeners (except *Axine belones* Abildgaard, 1794 and *Axine depauperati* Yamaguti, 1968) by having 35–40 testes. They differed from the published descriptions of *A. belones* by having a relatively transverse (vs. longitudinal) accessory piece and by lacking a markedly bifid vaginal sclerite. They differed from that of *A. depauperati* by having a body 4.8–6.0 × longer than wide and 62–81 haptoral clamps (vs. 13.6–13.8 × and 22–31, respectively). The *28S* phylogenetic analysis recovered our sequence in a clade of other Mazocraeidea spp. It was sister to species of Heteromicrocotylidae, Heteraxinidae, and Microcotylidae. All of these taxa were monophyletic and sister to species of Diplozoidae. This is the first axinid described from a flyingfish in the western Atlantic Ocean and first published nucleotide sequence for an axinid.

8. **The beetle *Tenebrio molitor* shows attraction to some, but not all, acids found in the feces of rats infected with the tapeworm *Hymenolepis diminuta*.** Orndorff, Katherine[1], Jenna D. Kirkland[1], Roger Ramirez Barrios[2], Anne C. Jones[2], Mason C. Martin[2], Tappey H. Jones[1], and Ashleigh B. Smythe[1]. [1]Virginia Military Institute, Lexington, VA and [2]Virginia Polytechnic Institute and State University, Blacksburg, VA.

The tapeworm *Hymenolepis diminuta* lives in rat intestines and passes its eggs through the rat's feces. The infected feces are then consumed by an intermediate host beetle to continue their life cycle. Previous studies revealed that the beetles Tenebrio molitor and *Tribolium confusum* exhibit attractive behavior towards *H. diminuta* infected feces, and that volatile chemicals from infected feces are also attractive to beetles. Our earlier research identified five volatile chemicals, small acids, present in infected rat feces but not in uninfected feces. Butyric acid was found in the greatest relative amount, but also found were 3-methylbutyric acid, 2-methylbutyric acid, pentanoic acid, and hexanoic acid. We then studied the attraction of *Tenebrio molitor* towards these acids. Each trial consisted of 10 beetles, starved for 24 or 48 hours, placed in the middle of a petri dish arena, and offered water (control) or one or more of the acids dried on clean glass microscope coverslips. We observed the beetles for 10 minutes and counted how many were near the control or acid at each minute. A related samples Wilcoxon signed rank test showed no significant attraction of both 24 (p=0.969) and 48 hour (p=1.0) starved beetles to a mixture of the 4 primary acids, but a significant (p=0.017) attraction to 3-methylbutyric acid and butyric acid (p=0.036). This study is the first to identify volatile chemicals from a tapeworm-infected host and show beetle attraction to particular acids that may enhance the likelihood of lifecycle completion.

9. **The use of lectins and fluorescence microscopy to reveal carbohydrate arrangements on *Brugia malayi* anatomy.** Pritts, Mariah E. and Rebekah T. Taylor. Frostburg State University, Frostburg, MD.

Lymphatic filariasis (LF), which causes severe lymphedema and elephantiasis in humans, is present in 73 countries across Africa, South America, Southeast Asia, and the Western Pacific. LF is an infection of the lymphatic system by the filarial worms *Wuchereria bancrofti*, *Brugia malayi*, and/or *Brugia timori*. Since filarial worms share many of the same molecules with their vertebrate hosts, treatment is challenging and not always completely effective. In short, more information about the basic anatomy of filaria is needed before effective drug targets can be identified. Here, I identify glycans on adult female and adult male *Brugia malayi* worms using fluor-labeled lectins and fluorescent microscopy. Lectins are proteins that bind to specific carbohydrate moieties that can be used histologically to visualize glycans on various tissues and cell types. Thus, I created a “glyco-atlas” of *Brugia malayi* anatomy. This resource complements traditional hematoxylin and eosin (H&E) staining to highlight specific tissues and anatomical structures. The information gained about the lectin-binding sites of worms can be used as a foundation for future research to identify potential drug targets, ultimately leading to a decrease in the prevalence of LF.

10. **Parasites of the eastern Everglades, Florida fishes: Bangham 1940 revisited.** Sawickij, Katerina[1], Christopher Blanar[2], Matthew J. Hoch[2], David Kerstetter[2], and Florian Reyda[1]. [1]State University of New York at Oneonta, Oneonta, NY and [2]Nova Southeastern University, Davie, FL.

We surveyed intestinal parasites of freshwater fish across the eastern portion of the Everglades, Florida from May to August 2023. The aim of this survey was to compare results to a classic parasite survey done in the area by Bangham in the late 1930’s. We investigated 715 fish of 31 species from 13 sites including storm water treatment areas, water conservation areas, Lake Okeechobee and surrounding water bodies. Fish were collected by seining, minnow trap, electrofishing, hook and line angling and donation by local anglers. Intestines were examined for all fish and a subset received full necropsy. Only 15 of Bangham’s original 45 species of fish were investigated in this study, reflecting the extensive environmental change in the habitat since the original study. Analysis is ongoing, but of the parasites observed, more immature worms were found than adult worms. Of the 15 overlapping host species between the two surveys, we only recovered a small subset of the original 22 adult parasite species. We documented several new locality and host records for parasites from native and invasive host species. From *Micropterus* sp. a new species of *Neoechinorhynchus* was documented with a unique egg morphology unlike any North American *Neoechinorhynchus* species. Also from *Micropterus* sp. a poorly-known, previously described species, *Neoechinorhynchus doryphorus*, was documented. Three non-native species of parasites were documented, including the invasive Asian fish tapeworm, *Schyzocotyle acheilognathi*, from *Notemigonus crysoleucas*, a *Neoechinorhynchus* species from *Mayaheros uropthalmus*, and a trematode from *Channa marulius*.

11. **Helmith communities of invasive lizards in the Ocala National Forest.** Boothe, Abigail[1], Michael Brennan[1], Jenna Palmisano[2], Anna Savage[2], and Stephen E. Greiman[1]. [1]Georgia Southern University, Statesboro, GA and [2]University of Central Florida, Orlando, FL.

The Ocala National Forest is home to a variety of endangered, threatened, and endemic lizards; however, many invasive species can also be found using the same habitats. Brown anoles (*Anolis sagrei*) and several species of geckos (*Hemidactylus* spp.) are all common in ONF. We collected these lizards from anthropogenic structures and natural landscapes from across the

Ocala National Forest to investigate their helminth communities. Brown anoles have high prevalence of a variety of nematodes and lower prevalence of digeneans and acanthocephalans. Geckos also carried a variety of nematodes in high prevalence along with cestodes and acanthocephalans with low prevalence. Both geckos and anoles were found with visceral pentastomiasis, while *H. turcicus* alone were found with pulmonary pentastomiasis (*Raillietiella frenatus*). As we conclude with our molecular identifications, we hope to compare our findings to similar communities in the southeast.

12. **Surveillance for ticks on outdoor workers in urban parks in Madrid, Spain.** Richmond, Kevin C.[1], Eva Banda[2], José I. Aguirre[2], Sonia M. Hernandez[1,3], and Michael J. Yabsley[1,3]. [1]Southeastern Cooperative Wildlife Disease Study, Department of Population Health, College of Veterinary Medicine, University of Georgia, Athens, GA; [2]Departamento de Biodiversidad, Ecología y Evolución, Universidad Complutense de Madrid, Spain; and [3]Warnell School of Forestry and Natural Resources, University of Georgia, Athens, GA.

The Iberian Peninsula has a high diversity of tick species and risks of tick-borne diseases is high for humans and animals. Although there are considerable data on the tick fauna of Spain, there are several invasive species (i.e., *Hyalomma* spp.) that have become established in the past few decades, so ongoing surveillance is needed to understand the risk of tick-borne diseases in the region. In addition, most studies are conducted in rural or suburban areas so there are comparatively few data for urban areas. From April 2022-October 2023, wildlife biologists working in urban parks in Madrid, Spain were asked to collect any ticks found crawling on or attached to them. Ticks were preserved in ethanol and identified using a combination of morphological characteristics and molecular characterization. Five sites were sampled and a total of 169 ticks were collected on 62 different days. Three tick species were detected including 156 *Hyalomma lusitanicum* on 55 people, 11 *Rhipicephalus sanguineus* sensu lato on 11 people, and 2 *Dermacentor marginatus* on 2 people. *Hyalomma* and *R. sanguineus* s.l. were found at all and most sites, respectively, while *D. marginatus* was only detected at one site (El Garzo) near the edge of the city. All three of these tick species are known to transmit important human pathogens indicating that people recreating in urban parks in Madrid, Spain may be at risk of tick-borne diseases.

13. **Past vs. present: a survey of the fish parasites of the tributaries of Oneida Lake, New York.** Whitcomb, Hannah G. and Florian Reyda. State University of New York at Oneonta, Oneonta, NY.

In 1932, Van Cleave and Mueller conducted a study on the parasite fauna of the fish in Oneida Lake and its tributaries, where they made many discoveries. Since 1932, the lake has undergone countless environmental changes which have impacted the invertebrate fauna, mollusks in particular. The present study is a fish parasite survey of multiple tributaries of Oneida Lake undertaken to compare both the recent and past survey data of the lake itself. The methods of this study included the collection of fish species via backpack shocking, e-boat and hook and line fishing, partial necropsy of fish to collect parasites and the mounting of parasites for identification using light and scanning microscopes. During the recent surveys of the lake, data suggested that certain parasite species had been 'missing.' For example, we encountered *Bunodera sacculata* in 3 of 31 *Perca flavescens*. *B. sacculata* uses a native clam as an intermediate host, which has been functionally extirpated due to the introduction of invasive species. In addition, the stream survey resulted in recovery of some species not originally reported by Van Cleave and Mueller. For example, eleven species of acanthocephalan were found, whereas only four were originally reported. The stream survey results also include multiple species of nematodes and cestodes. This survey fills a knowledge gap on the fish parasite data in the tributaries, provides context for the contemporary survey of the lake and demonstrates that the fish parasite species in the tributaries somewhat differ from those found in the lake.

14. **Cestode diversity of *Sorex* Shrews (Eulipotyphla: Soricidae) from Mongolia.** Ahmed, Rokeya[1], Joseph A. Cook[2], Bryan S. McLean[3], Kurt Galbreath[4], and Stephen E. Greiman[1]. [1]Georgia Southern University, Statesboro, GA; [2]University of New Mexico, Albuquerque, NM; [3]University of North Carolina Greensboro, Greensboro, NC; and [4]Northern Michigan University, Marquete, MI.

Shrews in the genus *Sorex* are widely distributed small insectivorous mammals that harbor diverse communities of helminths. This is due mostly to their diets of arthropods, which serve as intermediate hosts for many tapeworms in the order Cyclophyllidea. However, limited work has been done examining the overall cestode diversity of shrews across their ranges. This is especially true for Mongolia, where very few studies have been done examining the cestode diversity of *Sorex* shrews, and no work has been done on their phylogenetic positions using genetic data. As part of a larger mammal and parasite survey in Mongolia (2015, 2016, and 2022), we have sampled 4 species of Sorex across much of Mongolia for their helminth parasites. In total, we have collected 4 *S. isodon*, 17 *S. caecutiens*, 55 *S. roboratus*, and 67 *S. tundrensis*. Based on partial 28S rDNA and COI mtDNA sequences, as well as morphological analyses of stained and slide mounted specimens, we have identified 15 cestode species across 11 genera. We have completed Illumina whole genome sequencing for each of the 15 unique species and have assembled and annotated their mitochondrial genomes. These data will help to fill the knowledge gap related to the diversity and evolution of shrew cestodes by leveraging state-of-the-art phylogenomic approaches to inform new species descriptions, establish an evolutionary framework for regional species pools, and enable robust, phylogenetically-informed host-parasite community analyses.

15. **Sucking lice parasitizing small mammals in Mongolia.** Pickeral, April C.[1], Lance A. Durden[1], Stephen E. Greiman[1], Joseph A. Cook[2], and Bryan S. McLean[3]. [1]Department of Biology, Georgia Southern University, Statesboro, GA; [2]Museum of Southwestern Biology and Department of Biology, University of New Mexico, Albuquerque, NM; and [3]Department of Biology, University of North Carolina Greensboro, Greensboro, NC.

Sucking lice (Phthiraptera: *Anoplura*) are obligate hematophagous ectoparasites of eutherian mammals worldwide and many species are host specific. Sucking lice were collected from 27 species of small mammals (24 species of rodents, 2 species of lagomorphs and 1 species of soricid) in Gobi desert regions of Mongolia in 2022 to determine host specificity and to screen for undescribed species of lice. Host association data of each species of louse collected include infestation prevalence, mean intensity, and COI mtDNA barcode identity. *Hoplopleura acanthopus* showed minimal host specificity, parasitizing multiple species of voles, as documented for this Holarctic louse in North America. All other species of lice collected were specific to a single host species or to two congeneric host species. At least two undescribed species of sucking lice, based on morphology, were detected and will be formally described in the future. A potentially new species of *Hoplopleura* was recorded from *Cricetulus barabensis* (Chinese striped hamster) and new species of Polyplax was recorded from *Phodopus campbelli* (Campbell's dwarf hamster). In general, the sucking louse fauna of small mammals in desert regions of Mongolia showed high host specificity, although one species was recorded from several species of closely related hosts.

16. **Thermal imaging as a tool to facilitate diagnosis of equine protozoal myeloencephalitis.** Shiveler, Lauren B. and Gabriel J. Langford. Florida Southern College, Lakeland, FL.

Equine protozoal myeloencephalitis, EPM, is a neurologic disease caused by the protozoan *Sarcocystis neurona*. To diagnose EPM, a spinal tap is used to obtain cerebrospinal fluid (CSF), but this is dangerous for the horse. Recently, digital thermography has been used to help diagnose breast cancer and many other diseases that were once much harder and invasive to diagnose in human medicine. WellVu is a thermal infrared camera that was designed for veterinary thermal imaging. Since the camera's development, veterinarians have noticed horses with cold limbs when using this camera, which often presents with an inconsistent lameness, a clinical sign of EPM. To replace the dangerous practice of obtaining CSF fluid, there is potential to use thermal imaging to diagnose EPM. To test WellVu's ability to detect the clinical signs of EPM, i.e., cold limbs, horses were scanned with the WellVu camera to observe the difference between their lower limb and upper limb temperatures. Blood was obtained for an ELISA to test for the presence of *S. neurona* antibodies. After a month of treatment, the horses were rescanned to see if they responded to the anti-protozoan medication, with 70% of the horses coming back fully recovered from EPM symptoms. Ten controls scanned negative for EPM with the WellVu. If WellVu can reliably detect EPM, this non-invasive procedure can become the standard of care in clinical diagnosis for a disease that is increasing in the S.E. United States. The results of the investigation will be discussed at the meeting.

17. **Tales from the feathered frontier: investigating ectoparasite community shifts in seabirds with avian botulism.** Barber, Sonja E. and Kate L. Sheehan. Frostburg State University, Frostburg, MD.

The feather and skin surfaces of a bird provide several niches that support diverse ectoparasite communities, including feather mites, lice, ticks, and sticktight fleas. As ectoparasites feed, they exchange microbes with their hosts, like the pathogen that causes avian botulism (AB), *Clostridium botulinum*. At particular environmental thresholds, *C. botulinum* produces a suite of lethal neurotoxins that cause large scale avian die-off events. Ectoparasites do not transmit or perpetuate AB; however, symbiotic infracommunities of an infected bird could be impacted by changes in host condition associated with AB intoxication. Here, we investigate shifts in the ectoparasite communities of Black-Legged Kittiwake (*Rissa tridactyla*) associated with an AB die-off event on Middleton Island, Alaska in 2021 ('AB-intoxicated') when compared to birds collected under disease-free conditions ('Healthy') in 2016. We sorted and counted ethanol-preserved morphospecies of arthropods from the external surfaces of each host's carcass and confirmed unique ectoparasites with molecular techniques. We found that healthy birds carry larger abundances of ectoparasites while AB-intoxicated birds harbor more diverse and even ectoparasite infracommunities. We differentiate between AB-intoxicated birds and healthy birds with 92% accuracy (R2=0.67, discriminant analysis) and can discern most healthy birds by the presence of 2 feather mites and AB-intoxicated birds with 4 feather mites. The incongruity between the ectoparasite communities in healthy and AB-intoxicated birds illustrates the importance of host-disease condition on shaping symbiont assemblages. The use of ectoparasite communities holds promise as a novel surveillance tool for emerging disease, inconspicuous stressors, or dysbiosis in wild bird colonies.

18. **Effects of land management on native lizard helminth communities in Florida.** Brennan, Michael N.[1], Stephen E. Greiman[1], Jenna N. Palmisano[2], Lance D. McBrayer[1], and Anna E. Savage[2]. [1]Georgia Southern University, Statesboro, GA and [2]University of Central Florida, Orlando, FL.

The Ocala National Forest has been managed in a way that creates a mosaic of habitats and successional stages. Yet, many of the same lizard species can be found across these habitats. I investigated the helminth community in two native lizards (*Sceloporus woodi* and *Aspidoscelis sexlineatus*) captured from both longleaf pine savannas and Florida scrub of varying successional stage. Both species were mostly infected with nematodes, molecular ID pending. Both habitat and successional stage effect helminth prevalence in *S. woodi* but surprisingly, few *A. sexlineatus* had infections excepting one site. However, a lone *A. sexlineatus* was found to be infected with pulmonary pentastomiasis, a first for this species. Additionally, these pentastomes are believed to be *Raillietiella orientalis*, the increasingly prevalent snake lungworm believed to have been introduced from pythons in south Florida.

19. **SSS-Slippery systematics of slithering snake worms.** Von Holten, Zoe S.[1], Tyler J. Achatz[1], and Vasyl V. Tkach[2]. [1]Middle Georgia State University, Macon, GA and [2]University of North Dakota, Grand Forks, ND.

The Cyathocotylidae Mühling, 1896 is a globally-distributed family of digeneans parasitic in a wide range of definitive hosts: birds, fish, mammals, and reptiles. Few studies have generated molecular data for members of this family, and only one from a cyathocotylid parasitic in snakes. A few genera are known to infect snakes, including *Gogatea* Lutz, 1935, *Szidatia* Dubois, 1938, and *Mesostephanoides* Dubois, 1951. Members of these genera are only known from Africa and Asia. These genera have a long, convoluted taxonomic history with the validity of *Szidatia* and *Mesostephanoides* often being questioned. In the present study, we examined the relationships between cyathocotylid genera with a focus on those from snakes. We collected adult cyathocotylids from the intestines of snakes in Vietnam and Australia. Morphological and molecular (sequencing of the 28S rDNA and cox1 mtDNA) studies revealed the presence of 2 new species from Vietnam and Australia. This is the first report of a cyathocotylid from snakes in Australia. We also re-evaluate the status of 3 genera of snake cyathocotylids using combined morphological and molecular data. Identities of some other recently published cyathocotylids are re-evaluated based on DNA sequences.

20. **The endoparasite community of columbids in south Florida, and Eleuthera, Bahamas.** Zaffiro, Briana K.[1], David W. Kerstetter[2], and Christopher Blanar[1]. [1]Department of Biological Sciences, Halmos College of Arts and Sciences, Nova Southeastern University and [2]Department of Marine and Environmental Sciences, Halmos College of Arts and Sciences, Nova Southeastern University.

Family Columbidae in southeast Florida is a complex of six common native (N) and introduced (I) doves and pigeons. Populations of each species have varied over time, but southeast Florida and the Florida Keys have seen a recent surge in White-Crowned Pigeons, more commonly seen in The Bahamas. Although primarily herbivores, columbids also consume insects, which serve as intermediate hosts to many terrestrial parasite taxa. To assess ecological impacts of introductions, the endoparasite communities were examined from the following columbids: Eurasian Collared Dove (I; *Streptopelia decaocto*, n=31), Rock Dove (I; *Columba livia*, n=26), White-Winged Dove (N; *Zenaida asiatica*, n=5), White-Crowned Pigeon (N; *Patagioenas leucocephala*, n=47), Common Ground Dove (N; *Columbina passerina*, n=11), and Mourning Dove (N; *Zenaida macroura*, n=29). Additional specimens of White-Crowned Pigeon were obtained from Eleuthera, The Bahamas (n=17). Specimens were received frozen and the following organs examined: trachea, oesophagus, proventriculus, intestines, and cloaca, as well as the proventriculus and intestine washes. Parasites were stained and mounted prior to identification using standard taxonomic keys. Common species of parasites found were *Ascaridia columbidae*, *Dispharynx nasuta*, and *Capillaria* sp. These three parasites suggest foraging behaviors close to the ground in locations where Columbids may commonly excrete. Endoparasite prevalence varies by species, White-Crowned Pigeon hosts from southeast Florida and Eleuthera have similar prevalence and intensity rates. Native columbids showed lower prevalence and intensity rates than introduced species. Further studies are needed as endoparasites in columbids are an understudied aspect of their biology.

21. **Parasites of the invasive gray-headed swamphen (*Porphyrio poliocephalus*) in southern Florida.** Hilber, Alexia, David W. Kerstetter, and Christopher Blanar. Department of Marine and Environmental Sciences, Halmos College of Arts and Sciences, Nova Southeastern University.

The Gray-Headed Swamphen (*Porphyrio poliocephalus*) is a native wading bird of Southeast Asia. In 1996 it was introduced to Pembroke Pines, FL, USA and has since spread throughout the state, with the densest populations found in the northern Everglades region. As a recent invasive species to the United States, its endoparasite community has yet to be explored. This study aims to document temporal changes, through continuous sampling, to the endoparasite community and compare the communities of related co-occurring native species. In the swamphen's native range, they are mainly herbivorous, feeding on soft rushes and reeds, and opportunistically carnivorous. Parasites recorded in their native range include the echinostomes *Paryphostomum giganticum* and *Patagifer sanyali*. In Florida, they have adopted a diet consisting mostly of Gulf Coast Spikerush (*Eleocharis cellulose*) and *Panicum* spp. seeds. Specimens were collected from Water Conservation Areas 3A and 2A from April 2023 to present. Preliminary analysis has found two out of seven Gray-Headed Swamphens parasitized by a nematode, *Hystrichis* sp., one within the esophagus and the other in the proventriculus. Closely related native species, Purple Gallinule (*Porphyrio martinicus*) and Common Moorhen (*Gallinula chloropus*), host a more diverse endoparasite community that includes digeneans, nematodes, cestodes, and acanthocephalans. Soras (*Porzana carolina*), whose diet is most similar to swamphen's, are the closest community, structurally, being composed of nematodes with the occasional digenean. *Hystrichis tricolor* has been documented in all species ecologically comparable to the Gray-Headed Swamphen, and could be a generalist parasite of wading, herbivorous, marsh birds.

22. **Metazoan endoparasites of king mackerel (*Scomberomorus cavalla*) as possible biological tags.** Klingler, Charles A., David W. Kerstetter, and Christopher Blanar. Department of Marine and Environmental Sciences, Nova Southeastern University, Fort Lauderdale, FL.

The scombrid king mackerel (*Scomberomorus cavalla*) is a commercially-important epipelagic teleost distributed in subtropical and tropical waters in the western Atlantic Ocean. Two U.S. mainland stocks are currently recognized for federal management purposes: a Gulf of Mexico stock and a South Atlantic stock, with some mixing in southeast Florida and the Florida Keys. Previous research has demonstrated significant differences in parasite communities between different fish populations, making parasites potentially useful as biological tags for the purposes of mapping population movements and distribution. This study examines the endoparasites of king mackerel to assess the differences in the parasite communities between these two mainland stocks. Host fish specimens were donated by fishing tournaments targeting king mackerel, with specimens dissected in the lab to collect and identify parasites. Parasites from the Phyla Platyhelminthes, Nematoda, Acanthocephala and Arthropoda have been recovered to date from these king mackerel specimens (Gulf of Mexico, n = 77; South Atlantic, n = 45; South Florida, n = 49), with Classes Cestoda, Digenea, Monogenea and Anisakidae being especially prominent. Initial results suggest that there are community differences between the Atlantic and Gulf of Mexico regions.

23. **Spatiotemporal prevalence of a parasitic dinoflagellate, *Hematodinium perezi*, in the blue crab, *Callinectes sapidus*, and the water column of the Charleston Harbor Estuary, SC.** Korper, Hannah[1,2], Michael Kendrick[2], Isaure de Buron[1], Greg Rothman[2], and Yong Lengxob[2]. [1]College of Charleston, Charleston, SC and [2]South Carolina Department of Natural Resources, Charleston, SC.

Blue crab landings in South Carolina (SC) have experienced two decades of decline since 2000, reaching a 50 year low in 2021. Numerous factors may have contributed to this decline, including infection by the dinoflagellate *Hematodinium perezi*, which is known to harm and kill marine crustaceans worldwide. Despite the potential negative impact of this parasite on blue crab health and fisheries, little is known about its prevalence in the blue crabs and major waterways of SC. The aim of this study was to investigate the prevalence of infection by *H. perezi* in SC blue crabs as well as its presence in the Charleston Harbor estuary. The spatial prevalence of *H. perezi* in blue crab hemolymph was assessed across six major SC estuaries during 2022 and 2023 fall months using quantitative PCR. Preliminary results showed that overall prevalence was 2.98% and 9.84% for crabs sampled in 2022 (n=168) and 2023 (n=122), respectively. We are currently examining the temporal prevalence of *H. perezi* in blue crab hemolymph in parallel with eDNA analysis of the water column in the Charleston Harbor

estuary. Presence of *H. perezi* in the water column varied monthly but did not occur in January and February. Infection pattern in the crab hemolymph is predicted to depend on the life history of the blue crab. Altogether, our findings will provide foundational information on the dynamics of a potentially influential parasite in coastal SC and be critical for understanding disease dynamics in blue crabs in the Southeast USA.

24. **Digenean diversity within bats from the Darien Region of Panama.** Mcfarland, Alex.[1], Joseph A. Cook[2], Jonathan L Dunnum[2], Jocelyn P. Colella[3], and Stephen E. Greiman[1]. [1]Georgia Southern University, Statesboro, Georgia; [2]University of New Mexico, Albuquerque, New Mexico; and [3]University of Kansas, Lawrence, KS.

Digeneans are parasitic flatworms with complex life cycles that almost always require a mollusk first intermediate host, a second intermediate host that could be an invertebrate or vertebrate, and a vertebrate definitive host. Bats (Order Chiroptera) are a highly diverse group of mammals, with about 1,100 recognized species worldwide, with around 120 species found in Panama. Bats, especially insectivorous species, are hosts of a diverse array of helminth parasites, however, the distribution and overall diversity of their digenean parasites is poorly understood. As part of a larger pathogen focused field trip, we collected 312 bats representing 30 different species from the Darien region of Panama. From these, 37 bats were found to harbor digeneans in their intestines, stomach, and/or gallbladder. The most common bat host species found to be infected with digeneans were *Lophostoma silvicolum*, *Phyllostomus discolor*, *Saccopteryx bilineata*, and *Saccopteryx leptura*. Using DNA barcoding of the *28S* rDNA and COI mtDNA genes as well as morphological assessment using stained and mounted individuals, we have so far identified 10 unique digenean species, from multiple genera, including, *Urotrema*, *Plagiorchis*, *Anenterotrema*, and *Paralecithodendrium*.

25. **Island living: *Angiostrongylus cantonensis* is a novel threat to the Florida burrowing owl (*Athene cunicularia floridana*).** Castleberry, Nikole L.[1,6], Håkon Jones[1]; Nicole M. Nemeth[1,2], Brittany Piersma[3], Raul Boughton[4], Rebecca Hardman[4], Lisa A. Shender[4], Kayla B. Garrett[1,5], Teo Hui Xuan[1,2], Rebecca Radisic[1,2], Martha F. Dalton[1,2], and Michael J. Yabsley[1,5,6]*. [1]Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine, University of Georgia, Athens, GA; [2]Department of Pathology, College of Veterinary Medicine, University of Georgia, Athens, GA; [3]Audubon Western Everglades, Naples, FL; [4]Florida Wildlife Commission, Fish and Wildlife Research Institute, St. Petersburg, FL; [5]Warnell School of Forestry and Natural Resources, University of Georgia, Athens, GA; and [6]Center for Ecology of Infectious Diseases, Athens, GA.

Angiostrongylus cantonensis, a metastrongyloid parasite that uses rodents as definitive host and mollusks as intermediate hosts, poses significant public health concerns globally. We describe its emergence in a novel host, the Florida burrowing owl (*Athene cunicularia floridana*) on Marco Island, Collier County, Florida. The Florida burrowing owl is a state-listed species that has experienced steep population declines across its range, primarily due to habitat loss and fragmentation. Many populations are now restricted to urban environments, which have novel threats to the owls, such as exposure to anticoagulant rodenticides and novel pathogens, increased risk of predation, vehicle strikes, and increased disturbance at nest sites. Through diagnostic evaluation of carcasses and tissue sets submitted to the Southeastern Cooperative Wildlife Disease Study from 2019 to 2023, we diagnosed nine confirmed or suspected cases on Marco Island. Microscopic examination and PCR testing confirmed parasite identification. Additionally, ancillary testing ruled out other potential causes of neurological disease, such as rodenticides and West Nile virus. This study underscores the importance of surveillance and monitoring efforts for *A. cantonensis*, particularly in regions where novel hosts may serve as indicators of public health risk. Additionally, as urbanization and habitat fragmentation continue encroaching upon wildlife habitats, understanding the dynamics of host-parasite interactions becomes crucial for mitigating the spread of zoonotic diseases.

26. **A parasite perspective on invasion ecology: Contrasting acanthocephalan infections in native vs. non-native crayfish intermediate hosts.** Rothman, Gregory K.[1,2], Isaure de Buron[1], Kristina M. Hill-Spanik[1], Graham A. Wagner[2], Jordan F. Parish[2], Peter R. Kingsley-Smith[2], and Michael Kendrick[2]. [1]College of Charleston, Charleston, SC and [2]South Carolina Department of Natural Resources, Marine Resources Research Institute, Charleston, SC.

An emerging topic in invasion ecology relates to understanding how parasites interact with non-native host species. For example, hosts introduced into a new environment may carry non-native parasites or serve as novel hosts for native parasites. The complexity of these interactions is compounded when parasites are trophically transmitted and host taxa are closely related phylogenetically. The aim of this project is to compare acanthocephalan infections of two sympatric crustacean hosts, the native eastern red swamp crayfish, *Procambarus troglodytes*, and its introduced sister species the red swamp crayfish, *Procambarus clarkii*, in a wetland near Charleston, South Carolina, USA. We present results on prevalence and intensity of infection by juvenile stages (cystacanths) of two acanthocephalans, *Ibirhynchus dimorpha*, and a yet to be described acanthocephalan in the family Polymorphidae. Crayfish collections were made in September 2023 (57 *P. clarkii* specimens and 30 *P. troglodytes* specimens) and February 2024 (32 *P. clarkii* specimens and 22 *P. troglodytes* specimens). Size and sex of crayfish were recorded. Cystacanths were identified morphologically and molecularly via sequencing of partial COI mtDNA. The effects of collection month, host size, and host sex on prevalence and intensity of infection by both acanthocephalans were determined using generalized linear models. Only the introduced crayfish was found to be infected by the novel polymorphid. Species description efforts are ongoing. Results highlight the complexity of animal interactions when both introduced and native parasite hosts live in sympatry.

27. **A Geographical and Molecular Analysis of the Mosquito Vector Population in the Cumberland Gap Region.** Williams, Stacie D., Logan Allinson, Emily Williams, Daryel Escandell, Kensey Smartt, and Charles Faulkner. Lincoln Memorial University, Harrogate, TN.

Canine Heartworm Disease (CHWD) is caused by an infection with the nematode parasite Dirofilaria immitis transmitted through the bite of a mosquito carrying the infective stage larva. Through proper capture, processing, and molecular analysis we can determine the presence of heartworm DNA within the mosquito population in the area. In a previous study conducted in the Cumberland Gap Region, revealed an approximate 2% prevalence of heartworm DNA within the resident mosquito population. In this study, we continued surveillance of the Cumberland Gap Region and processed mosquitos collected from 2020-2021. Our results revealed the most abundant mosquito species in our area are: Cx. pip, Cx. err, Ae. jap, Ae. alb, and An. pun. After collected mosquitos are properly sorted into genus and species, they are then placed in pools ranging from 1-10 mosquitos. The pools then undergo DNA extraction, PCR, and gel electrophoresis to detect heartworm DNA in the mosquito pool. Out of the 355 pools surveyed, we detected approximately 53 pools that detected DNA. Continued processing of collected mosquito pools is imperative in determining the true prevalence of heartworm in our vector population. Our next steps include continued processing, DNA sequencing, and an epidemiological surveillance to determine if weather patterns and location influence the vector population in the Cumberland Gap Region.

28. **Another new genus and species of fish blood fluke (Digenea: Aporocotylidae) from a common fish (white mullet, *Mugil curema*) in the Gulf of Mexico, including pathology and phylogenetic analysis.** Micah B. Warren, Steven P. Ksepka, Triet N. Truong, Stephen S. Curran, Haley R. Dutton, and Stephen A. Bullard. Southeastern Cooperative Fish Parasite and Disease Laboratory, School of Fisheries, Aquaculture, and Aquatic Sciences, Auburn University, Auburn, AL.

Fish blood flukes (Aporocotylidae Odhner, 1912) of mullets (Mugiliformes: Mugilidae) comprise three nominal species: *Cardicola mugilis* Yamaguti, 1970 and *Plethorchis acanthus* Martin, 1975

infect *Mugil cephalus* in the Central Pacific Ocean and in the Brisbane River (Australia), respectively, and *Cardicola brasiliensis* Knoff & Amato, 1992 infects *Mugil liza* from the southwestern Atlantic Ocean. Specimens of *Mugil curema* were captured in Deer River, a coastal saltmarsh environment of Mobile Bay in the northern Gulf of Mexico, using a cast net and examined for blood fluke infections. Live blood flukes were fixed in 10% formalin for morphology and preserved in 95% ethanol for DNA extraction and phylogenetic analysis. Tissues were fixed in 10% formalin for histopathology. The new species differs from the nominal mugilid-infecting aporocotylids by having the combination of two testes, post-caecal testes, a uterus with straight ascending and descending portions, and a common genital pore. The 28S phylogeny recovered sequences of the new species and *P. acanthus* as sister taxa and Aporocotylidae as monophyletic. Carditis associated with intense infections comprised endocardial hyperplasia resulting in a thickened cardiac endothelium. Probable dead or deteriorating eggs in myocardium were encapsulated by granulomas composed of epithelioid histiocytes. Live eggs infected the afferent artery of gill filaments and were associated with varied hyperplasia of the overlying epithelium and, in high intensity infections, hemorrhaging from the afferent artery. This is the first aporocotylid infecting a mullet from the northwestern Atlantic Ocean and the second description of demonstrable endocarditis attributed to an adult fish blood fluke infection.

29. **Field surveys, comparative parasitology, and laboratory stress tolerance of freshwater introduced mystery snails in the Mid-Atlantic.** Fowler, Amy E.[1], Grace Loonam[1,2], Pratyush Jaishanker[1], Nicholas T. Lewis[1], Daya Hall-Stratton[1], Sarah Goodnight[1], and April M. H. Blakeslee[2]. [1]George Mason University, Fairfax, VA and [2]East Carolina University, Greenville, NC.

Freshwater molluscs are among the most successful introduced species. We performed field surveys and laboratory experiments to show that freshwater Japanese mystery snails, *Heterogen japonica*, experience parasite release, have the reproductive strategy of crawl-away juveniles, and can tolerate air exposure in introduced populations. Populations of *H. japonica* have experienced a genetic bottleneck in the introduced range and were female skewed. Trematode diversity was higher in indigenous snails, but up to 34% of *H. japonica* were infected with aspidogastrean trematodes. Of the two cryptic lineages of aspidogastreans, one was shared between *H. japonica* and native snails, suggesting host-switching. In laboratory trials, 600 juvenile *H. japonica* from 28 females were used to test the interaction between salinity (0.2 and 2 PSU) and temperature (25°C, 34°C and 38°C). All juveniles in 25°C (except one in 0.2 PSU) survived, and all juveniles in 38°C died by 14 days. Importantly, juveniles in 2 PSU survived for ≥2 days across all temperatures, indicating scope for expansion through estuaries. To understand their desiccation tolerance, *H. japonica* were exposed to air for hours (juveniles, n=849) or weeks (adults, n=650) and their mortality assessed. While all juveniles, except one, died after 48 hours, between 25% and 63% of adults survived >13 weeks of constant air exposure. For both juveniles and adults, larger snail size was correlated with longer survivability. Determining the tolerances of introduced species is an important step in identifying at-risk areas and targeting control efforts, helping us understand the possible future spread under a changing climate.

30. **The role of centrachid host diversity on *Posthodiplostomum* spp. infection in bluegill sunfish (*Lepomis macrochirus*).** Zimmermann, Michael R.[1,2] and Madison Upperman[2]. [1]University of Mount Union, Alliance, OH and [2]Shenandoah University, Winchester, VA.

The role of species diversity and disease risk has been spurred by rapid biodiversity losses in the changing landscape. The dilution effect, a leading hypothesis for the importance of biodiversity in disease reduction, suggests that increasing species diversity within a system decreases the risk of disease amongst the organisms inhabiting it. Amongst the most common sportfish inhabiting freshwaters of North America are bluegill sunfish (*Lepomis macrochirus*), which frequently serve as a second intermediate host for one of the most common centrarchid fish parasites, *Posthodiplostomum* spp. (white grub). The dilution effect was analyzed in two data sets: (1) a collection of 4,583 centrarchid fish from 18 lakes and ponds in northern Virginia; (2) a meta-analysis of 13,663 centrarchid fish from 306 lakes and ponds across the continental United States. The prevalence, intensity, and abundance of *Posthodiplostomum* spp. infecting *L. macrochirus* were analyzed to determine if lake surface area, *Lepomis* diversity, and centrachid diversity impacted parasite infection in the focal host. Both *Lepomis* diversity and centrarchid diversity exhibited significant correlations where increases in species diversity resulted in decreased parasite burden on *L. macrochirus* hosts. Additionally, there were varying effects of centrarchid species co-occurrence. This study indicates the importance of species diversity in reducing the parasite burden in one of the more common freshwater sportfish species in the U.S. Additionally, *Posthodiplostomum* spp. only has a significant impact on fish health in high intensities (> 900 metacercariae) and reducing the parasite burden has important consequences for long-term management of *L. macrochirus*.

31. **Investigating the anthelmintic potential of *Momordica charantia* against hookworm infections.** Jackson, Catherine A., Elise L. McKean, Andrea Langeland, and John M. Hawdon. George Washington University, Washington, D.C.

Hookworm infections pose a significant health threat in developing countries, particularly affecting vulnerable populations with limited healthcare access. The inevitable emergence of anthelmintic resistance, driven by widespread prophylactic drug administration underscores the urgency for novel treatment approaches. *Momordica charantia*, or bitter melon, is cultured widely in tropical regions where hookworm is endemic, and is often used in traditional medicine practice to treat intestinal parasite infections. We used two in vitro assays to investigate anthelmintic activity in *M. charantia* extract (MCE). First, an activation assay was used with Ancylostoma caninum L3 larvae to evaluate larval feeding inhibition, examining effects of storage conditions on activity, impact on wild-type and resistant nematode isolates, and activity retention following organic extraction in various solvents. Second, a survival assay was used in which adult *Ancylostoma ceylanicum* are exposed to varying concentrations of MCE and lettuce (*Lactuca sativa*) extract, our control plant material, over 48 hours. Noteworthy findings include enhanced inhibition of larval feeding with prolonged frozen extract storage, heightened efficacy of *M. charantia* on anthelmintic-resistant A. caninum, and optimal bioactivity retention in the most polar solvent following organic extraction. Adult assays demonstrated that 50 mg/mL of M. charantia will kill adult *A. ceylanicum* within 24 hours, where the same concentration of *L. sativa* will not. These results highlight the potential of *Momordica charantia* as a promising alternative for treating parasitic hookworm infections, addressing the critical need for effective interventions amidst emerging anthelmintic resistance.

32. **Pre- and post-infection volatiles in rate feces infected with the tapeworm *Hymenolepis diminuta*.** Jones, Anne C.[1], Roger Ramirez Barrios[2], Mason C. Martin[1], Tappey H. Jones[3], and Ashleigh B. Smythe[4]. [1]Department of Entomology, Virginia Polytechnic Institute and State University, VA; [2]Department of Biomedical Sciences and Pathobiology, VA-MD College of Veterinary Medicine Virginia Polytechnic Institute and State University, Blacksburg, VA; [3]Department of Chemistry, Virginia Military Institute, Lexington, VA; and [4]Department of Biology, Virginia Military Institute, Lexington, VA.

Insects strongly rely on olfaction to detect food sources, mates, and predators. It has been known for over 25 years that feces from rats infected with the tapeworm *Hymenolepis diminuta* are more attractive to the beetle intermediate host (*Tenebrio* sp. or *Tribolium* sp.) than feces from uninfected rats. A volatile compound (or compounds) in infected rat feces were shown to attract the intermediate host *Tribolium confusum*. However, these compound(s) were never been identified. Here we identified the volatiles emitted from rat feces infected with *H. diminuta*. Four 8-week-old female Sprague Dawley rats were infected with *H. diminuta* (Virginia Tech IACUC protocol 22-050), and fecal samples pre- and post-infection were collected. Volatile emissions from pre- and post-infection feces were collected and identified with GC-MS analysis.

Five volatile carboxylic acids were uniquely emitted from post-infection feces, with butyric acid emitted in the greatest relative quantity. Volatile attractiveness to *T. confusum* is being assessed through behavioral bioassays. This is the first report identifying the volatiles found in feces of rats infected with *H. diminuta* and highlights the essential role of chemical signaling in parasite-host(s) interactions.

33. **Did brain-infecting scuticociliates (*Philisterida* sp.) kill wild sharks in the northwestern Atlantic Ocean?** Ksepka, Steven P.[1], Alisa L. Newton[2], and Stephen A. Bullard[1]. [1]Southeastern Cooperative Fish Parasite and Disease Laboratory, School of Fisheries, Aquaculture, and Aquatic Sciences, Auburn University, Auburn, AL 36849 and [2]OCEARCH, Park City, UT.

Most scuticociliates are free-living in marine environments but several can infect fishes opportunistically. During August and September 2018, moribund smooth dogfish (*Mustelus canis*; Carcharhiniformes: Triakidae) were observed stranding and/or washing ashore dead on Coney Island and Brighton Beach, New York, USA. When returned to the water, moribund dogfish failed to right themselves, swam short distances, and settled to the bottom before stranding again soon thereafter. Eight of these dogfish were necropsied. Grossly, we observed softening of the olfactory lobe, hemorrhaging of the meninges, and opaque, bloody cerebral spinal fluid. Biopsies of brain from 2 smooth dogfish were wet-mounted and observed with a compound microscope equipped with differential interference contrast optical components, revealing an infection by a species of *Philasterida* Small, 1967 (Ciliophora: Scuticociliatida) in all sharks examined. Infected brain exhibited acute necrotizing meningoencephalitis with intralesional scuticociliates. A 584 base pair fragment of the small subunit ribosomal rDNA (18S rDNA) was identical to sequences ascribed to *Philasterides dicentrarchi* Dragesco, Dragesco, Coste, Gasc, Romestand, Raymond, & Bouix, 1995(Philisterida: Philasteridae) and Miamiensis avidus Thompson & Moewus, 1964 (Philisterida: Parauronematidae). Our results agree generally with a 2017 study reporting mortalities of leopard sharks (*Triakis semifasciata*; Triakidae) in San Francisco Bay attributed to *M. avidus* infecting the brain. Evidence of any single pathogen killing a wild shark in nature is rare and report worthy. Our results indicate that these sharks died because of this infection. If so, this would constitute the first report of an infectious disease killing a wild elasmobranch in the Atlantic Ocean.

34. **Inter- and intra-institutional comparison of the fecal microbiome of *Schistosoma mansoni* infected mice.** Mhanna, Mariam A., David T. Gauthier, and Lisa M. Shollenberger. Old Dominion University, Norfolk, VA.

Schistosoma mansoni is a blood fluke that infects their definitive hosts when they enter freshwater contaminated with infectious stage (cercariae) of the parasite. Once in the host, cercariae develop into male or female worms that reproduce sexually in the mesentery and produce eggs. The eggs can breach the intestinal wall for excretion in feces or they remain in the body in the form of granulomas. This egg pathobiology explains how a blood fluke surviving in the mesentery can impact the microbial composition of feces. Prior research showed that infection with *S. mansoni* caused alterations in composition and diversities of the gut commensals of intestinal tissue sections. The variability of microbiome studies and the ability to replicate studies and still observe comparable results is often challenging and requires a lot of rigor and consistency, however, we hypothesize that chronic schistosome infections cause conserved changes to the gut microbiome that are independent of investigator or institution. In this study, we examine the fecal microbiome compositions and diversities compared between healthy BALB/c mice and those chronically infected with *S. mansoni* at two independent institutions.

35. **Biodiversity differentially impacts disease dynamics across marine and terrestrial habitats.** Pagenkopp Lohan, Katrina M.[1], Sarah A. Gignoux-Wolfsohn[2], and Gregory M.

Ruiz[1]. [1]Environmental Research Center, Edgewater, MD 21037 and [2]University of Massachusetts Lowell, Lowell, MA.
The relationship between biodiversity and infectious disease, where increased biodiversity leads to decreased disease risk, originated from research in terrestrial disease systems and remains relatively underexplored in marine systems. Understanding the impacts of biodiversity on disease in marine versus terrestrial systems is key to continued marine ecosystem functioning, sustainable aquaculture, and restoration projects. We compare the biodiversity–disease relationship across terrestrial and marine systems, considering biodiversity at six levels: intraspecific host diversity, host microbiomes, interspecific host diversity, biotic vectors and reservoirs, parasite consumers, and parasites. We highlight gaps in knowledge regarding how these six levels of biodiversity impact diseases in marine systems and propose two model systems, the *Perkinsus*–oyster and *Labyrinthula*–seagrass systems, to address these gaps.

36. **A new genus of Transversotrematidae (Digenea) and first morphological and nucleotide-based confirmation of the life cycle of a transversotrematid in North America.** Truong, Triet N. and Stephen A. Bullard. Southeastern Cooperative Fish Parasite and Disease Laboratory, School of Fisheries, Aquaculture, and Aquatic Sciences, Auburn University, Auburn, AL.

We propose a new genus for the freshwater transversotrematids *Transversotrema patialense* Soparkar, 1924 and *Transversotrema chauhani* Agrawal and Singh, 1960. The new genus is unique by the combination of lacking an oral sucker and an extensively coiled uterus as well as having testes that are not deeply lobed and that abut or nearly abut the inner posterolateral margins of the digestive tract, a pre-oral genital pore, an ovary that is anterior to and abuts or nearly abuts the sinistral testis, non-embryonated eggs, typically having none or sparse vitelline follicles between the testes and ceca, an oblong, median and primarily inter-testicular vitelline reservoir, and a subterminal excretory pore opening on the dorsal body surface between the level of the cyclocoel and posterior body end. We describe the redia and cercaria of a species of the new genus from the red-rimmed melania, *Melanoides tuberculata* (Müller, 1774) (Cerithioidea: Thiaridae) and their corresponding adult from beneath the scales of the zebrafish, *Danio rerio* (Hamilton, 1822) (Cypriniformes: Danionidae). All hosts were sampled from a spring-fed earthen pond private aquaculture facility near Ruskin, Florida. No transversotrematid life cycle was known from North America previously. Our *28S* and *ITS2* transversotrematid sequences from Florida were most similar to those of a transversotrematid cercaria shed from red-rimmed melania from Mayagüez, Puerto Rico and differed by 134 and 69 nucleotides, respectively. Both phylogenetic analyses recovered the new genus as monophyletic and sister to a clade comprising *Transversotrema* spp. plus *Crusziella formosa*.

37. **Warm and cold: seasonal flux of a parasite population in a subarctic lake.** Sheehan, Kate L. Frostburg State University, Frostburg, MD.

Birds serve as hosts to several suites of parasites, which change seasonally as host geographic location (migration) and behaviors (dietary and mating) change. Likewise, the life cycles of parasites are determined by host availability and environmental thresholds that can either stimulate or hamper cycle progression. Thus, the extent to parasite success at any specific locality is dependent on biotic and abiotic factors. An excellent natural laboratory occurs in subarctic lakes (Cheney Lake, Anchorage, AK), where thermal conditions and the presence of migratory host species changes drastically between seasons. Few birds are resident on Cheney Lake during winter; however, several hundred birds inhabit or are regular visitors to this waterbody once lake ice retreats. As such, the fish and invertebrate assemblages change from season to season, as thermal regimes shift throughout the year and avian predation rates are more frequent when birds are more abundant. Here, we review the seasons of Cheney Lake as documented over the last 3 years through the populations of its inhabitants, ranging from invertebrates, fishes, and avifauna. We further define the importance of seasonal regularity in climatic conditions that impact both hosts and parasites and the evolutionary consequences of fluctuations in those conditions for a parasite suggested to exhibit semelparous reproductive strategies.

38. **Resolution of some taxonomic problems in *Diplomonorchis* Hopkins, 1941 from coastal USA.** Curran, Stephen S. and Stephen A. Bullard. Southeastern Cooperative Fish Parasite and Disease Laboratory, School of Fisheries, Aquaculture, and Aquatic Sciences, Auburn University, Auburn, AL.

Diplomonorchis Hopkins, 1941 (Monorchiidae Odhner, 1911) includes digeneans that infect the digestive tract of invertebrate-eating marine fishes worldwide. Prevailing knowledge of monorchiid life histories suggests that monorchiids have a simple tailed, distome cercariae that develops within sporocysts in the viscera of bivalves. Cercariae either encyst in the excurrent siphon of the bivalve or swim out and encyst in or on a variety of invertebrates. Fish become infected by eating metacercariae in invertebrates. Currently, 11 accepted species have been assigned to *Diplomonorchis* Hopkins, 1941. Members of this genus have two opposing testes, a vitellarium concentrated in the gonadal region of the hindbody, and an I-shaped excretory bladder. Perhaps 8 species are endemic to the western Atlantic Ocean. *Diplomonorchis micropogoni* Nahhas and Cable, 1964, described from fishes in coastal Jamaica, was judged morphologically indistinguishable from the type-species *Diplomonorchis leiostomi* Hopkins, 1941 in 1969 and demoted as a junior subjective synonym of the latter. Since then, *D. leiostomi* has been widely and frequently reported from the western Atlantic Ocean. We obtained new molecular and morphological data suggesting *D. micropogoni* should be resurrected. New collections of specimens from coastal waters of the USA, examination of museum specimens, and new ribosomal DNA sequences revealed the presence of a new species plus a complex of species previously identified as *D. leiostomi*.

39. **Highly modified and immunoactive N-glycans of *Dirofilaria immitis* and *Trichuris suis*.** Wilson, Iain B.H.[1], Barabara Eckmair[1], Francesca Martini[2], Richard D. Cummings[3], and Katharina Paschinger[1]. [1]Universität Für Bodenkultur Wien, Austria; [2]ETH Zürich, Switzerland; and [3]Harvard Medical School, Boston.

Glycans are key to host-pathogen interactions, whereby recognition by the host and immunomodulation by the pathogen can be mediated by carbohydrate binding proteins, such as lectins of the innate immune system, and their glycoconjugate ligands. Previous studies have shown that excretory-secretory products of nematodes exert immunomodulatory effects in a glycan-dependent manner. To better understand the mechanisms of these interactions, we prepared N-glycans from both *Dirofilaria immitis* and *Trichuris suis* and both analyzed their structures and used them to generate natural glycan microarrays. With these arrays we explored the interactions of glycans with C-type lectins, C-reactive protein and sera from infected animals. In-depth analysis revealed not only fucosylated LacdiNAc motifs with and without phosphorylcholine moieties, but species-specific elements including glucuronylated and chito-oligomer antennae in *D. immitis* and phosphorylcholine-modified mannose and N-acetylhexosamine-substituted fucose residues in *T. suis*, in the context of maximally tetraantennary N-glycan scaffolds. In summary, the glycans of *D. immitis* and *T. suis* are recognized by both the innate and adaptive immune systems, and also exhibit species-specific features distinguishing their glycomes from eachother and those of other nematodes.

40. **Variation in diplostomid parasite infection patterns and pathology in bluegill sunfish (*Lepomis macrochirus*) reproductive morphotypes.** Zimmermann, Michael R.[1,2], Cassidy Wells[2], and Simone Meadows[2]. [1]University of Mount Union, Alliance, OH and [2]Shenandoah University, Winchester, VA.

Bluegill sunfish (*Lepomis macrochirus*), a common North America sportfish, employ a mating system with multiple male reproductive morphotypes that include nest-building α-males with high reproductive investment and satellite β-males that are nest-parasites with no parental investment. Diplostomid parasites, particularly *Posthodiplostomum* spp. (white grub) and

Uvulifer ambloplitis (black spot disease), are amongst the most common parasite species infecting *L. macrochirus*, but their impact on fish health is debated with extensive variability reported on their effects. This study investigated the pathological impact of diplostomid parasites on *L. macrochirus*, differing infection patterns between male morphotypes, and differential health impacts between host morphotypes. In total, 3,406 *L. macrochirus* were collected from 18 lakes and ponds in northern Virginia. The fish were necropsied to identify and enumerate the diplostomid parasites infecting the hosts. In low abundance, neither diplostomid parasite impacted the body condition of *L. macrochirus*, but both *Posthodiplostomum* spp. (> 900 metacercariae) and *U. ambloplitis* (> 40 metacercariae) negatively impacted *L. macrochirus* health in high abundance, indicating there may be a threshold for diplostomid parasitism to have a significant impact on *L. macrochirus* health. Alpha-males recruited significantly more diplostomid parasites than β-males and had a greater proportion of hosts exceeding the infection thresholds in both parasite species. These parasitism differences and impact on host body condition may be contributing to the maintenance of an inferior reproductive morphotype in greater abundance than would be expected based on reproductive output.

41. **Invasion of the body snatchers: the role of parasite introduction in host distribution and response to salinity in invaded estuaries.** Blakeslee, April M. H.[1], Darby L. Pochtar[2], Amy E. Fowler[2], Chris S. Moore[1], Timothy S. Lee[1], Mark E. Torchin[3], Whitman A. Miller[4], Gregory M. Ruiz[4], and Carolyn K. Tepolt[5]. [1]Biology Department, East Carolina University, Greenville, NC; [2]Department of Environmental Science and Policy, George Mason University, Fairfax, VA; [3]Smithsonian Tropical Research Institute, Panama City, Panama; [4]Invasion Ecology Lab, Smithsonian Environmental Research Lab, Edgewater, MD; and [5]Biology Department, Woods Hole Oceanographic Institution, Woods Hole, MA.

In dynamic systems, organisms are faced with variable forces that may impose selective trade-offs. Salinity is a major physical driver of estuarine diversity, while parasites are key biotic forces shaping host distribution and demography. We tested for trade-offs between low-salinity stress and parasitism in a castrating parasite and host crab, performing field surveys every 6-8 wks over 3 yrs along salinity gradients to determine factors influencing parasite prevalence, host abundance, infection probability, and taxa diversity. We examined demographic data from ~12,000 crabs, and analyzed temperature, salinity, and taxa data from 20 seasonal sampling events. Further, a lab experiment investigated signatures of low-salinity stress on host response (time-to-right and gene expression). We found salinity and temperature significantly affected parasite prevalence, with sites <10 PSU lacking infection, and populations in moderate salinities at warmer temperatures attaining prevalence as high as 60%. An individual's infection probability was driven by salinity, host size, and season, and host abundance was negatively associated with parasite prevalence. Gene expression was plastic to acclimation salinity, but several osmoregulatory and immune-related genes demonstrated source-dependent salinity response. We identified a salinity-associated genetic marker, suggesting possible selection on standing variation. Thus, selective trade-offs in naturally dynamic systems can profoundly shape host evolutionary ecology.

42. **Exploring parasite-induced alterations in sociality and behavior in estuarine fishes.** Blanar, Christopher A.[1], Delaney Farrell[1], Hannah Bauman[1], Laura Nicolas[1], and Lauren E. Nadler[2]. [1]Nova Southeastern University, Fort Lauderdale, FL and [2]University of Southampton, Southampton, UK.

Parasites often modify host behavior to enhance their own survival and transmission. In California, the trematode *Euhaplorchis californiensis* has been shown to infect the brain and modify the behavior of its second intermediate host- a killifish- making them more susceptible to predation by fish-eating wading birds, the parasite's definitive hosts. In Florida, we explore how individual and social behavior are altered in gulf killifish (*Fundulus grandis*) following controlled infection with a closely related but as yet unnamed parasite (*Euhaplorchis* sp. nov.) with a nearly identical life cycle. We've examined how a suite of behavioral traits (sociality, anti-

predator response, and personality) are altered in experimentally infected hosts, with the long term goal of understanding how such behavioral changes scale up to population and community level in natural habitats. For example, we explore how infection alters individual personality traits, using behavioral assays for boldness (tendency to take risks) and exploration (willingness to explore novel environments). Our data support the hypothesis that infected individuals are bolder and more exploratory than uninfected individuals, which presumably makes them more susceptible to predation. We also detected significant effects of infection on fast-start escape response reaction times, speed, and acceleration in response to simulated predators. As these small-bodied fishes play a key role in estuarine food webs, parasite induced changes in behavior could have far-reaching consequences in these ecosystems and may present a model for generating hypotheses that can be tested in host-parasite systems from similar habitats around the world.

43. **ParasiteBlitz: A fruitful endeavor at Stono Preserve, SC. Part I. Fishes.** de Buron, Isaure[1], Kristina M. Hill-Spanik[1], Maarten PM Vanhove[2], Dakeishla M. Diaz-Morales[3,4], Gregory K. Rothman[5], Simona Georgieva[6], Michael R. Kendrick[5], Nikol Kmentova[2], and Stephen D. Atkinson[7]. [1]College of Charleston, Charleston, SC; [2]University of Hasselt, Hasselt, Belgium; [3]University of Duisburg-Essen, Essen, Germany; [4]University of Washington, Seattle, WA; [5]South Carolina Department of Natural Resources, Charleston, SC; [6]Bulgarian Academy of Sciences, Sofia, Bulgaria; and [7]Oregon State University, Corvallis, OR.

Parasites are typically neglected in biodiversity surveys and consequently, global parasite diversity is vastly unknown. To address this deficit, parasitologists can adopt the concept of a BioBlitz and take a 'moonshot'-like approach to identify parasite diversity in targeted localities. As a team of parasitologists with complementary and methodologically aligned expertise, we examined parasite diversity at a previously unexplored preserve in coastal South Carolina. Over two weeks in April 2023, we intensively sampled fishes and invertebrates, and collected sediment and water from four physically connected wetland habitats: a forested wetland, freshwater pond, brackish impoundment, and tidal creek. Parasites collected from hosts were preserved for both morphological and molecular analyses; sediment and water were preserved for subsequent DNA metabarcoding and high-throughput sequencing. Analyses and identifications are ongoing. To date, traditional collections revealed the presence of multiple species from 11 major parasite taxa infecting fishes, 9 infecting invertebrates, and 2 cases of hyperparasitism. At least one myxosporean species needs description. Here we present results from fish examination only. A total of 122 fish of 17 species were examined, of which 93 individuals (> 76% infection) of 16 species were infected with at least one parasite taxon. At the fish species level, 88 fish-parasite combinations were observed. The impoundment and creek displayed the highest diversity. Although limited by gear, collection permits, seasonality, and time constraints, the BioBlitz approach was fruitful overall and should be encouraged among the parasitologists' community, moreover because metabarcoding results are expected to fill gaps in biodiversity missed by traditional methods.

44. **Pentastomes in Paradise: *Raillietiella* infections in Galapagos tortoises and other hosts in the Galápagos, Ecuador.** Yabsley, Michael J.[1], Andrea Loyola[2], James Flowers[3], Chelsea Drumgoole[3], Elizabeth Walsh[3], Mateo Davila[4], Diego F. Cisneros-Heredia[4], Juan Pablo Muñoz-Pérez[4], Diego Páez- Rosas[4],Kayla B. Garrett[1], and Gregory A. Lewbart[2]. [1]University of Georgia. Athens GA; [2]Dirección Parque Nacional Galápagos, Ecuador; [3]College of Veterinary Medicine, North Carolina State University. Raleigh NC; and [4]Universidad San Francisco de Quito USFQ. Quito, Ecuador.

The only pentastomes reported in chelonians are from aquatic turtles. In March 2021, 185 juvenile tortoises (*Chelonoidis niger*) were confiscated after an attempted illegal exportation from the Galápagos. At seizure, ten were dead and another 25 tortoises subsequently died. A 3-month-old tortise had 11 pentastomes in the lungs. The pentastomes were identified as a

Raillietiella sp. based on morphology. All females were gravid. Molecular analysis confirmed that the parasites were a *Raillietiella* sp. Based on the COI gene, it was most similar (82.7% identical) to a *Raillietiella* species from a Caribbean anole (*Anolis cristatellus*) in Florida. Based on the 18S rRNA gene sequence (1799 bp), it was most similar (99.3% identical) to two undescribed *Raillietiella* species followed by R. aegypti from a berber skink (*Eumeces schneideri*) from Saudia Arabia. Phylogenetically, with both molecular targets, the *Raillietiella* sp. from the Galápagos tortoise grouped with other *Raillietiella* spp. and was basal within the group. Subsequent surveillance work has confirmed pentastome infections in lava lizards (*Microlophus* spp.) and a native gecko (*Phyllodactylus darwinii*). Adult pentastomes from a dead lava lizard were morphologically a *Raillietiella* species. Molecular work to compare parasites from the different hosts is ongoing. Currently, the origin of this parasite (native to Galápagos or introduced) and the life cycle are unknown. Because some pentastome species, especially when in aberrant hosts, can be pathogenic, additional studies of parasites in native and introduced reptile and amphibian species in the Galápagos are needed to better understand the risk this parasite poses to Galápagos tortoises.

45. **Nested Subsets in Parasite Community Ecology: Celebrating 30 Years of "meh".**
Zelmer, Derek A. University of South Carolina Aiken, Aiken, SC.

Regions that are characterized by having the more species rich communities contain most or all of the species in the more depauperate communities are referred to as nested subsets. Around the turn of the century, software packages (in particular the "nestedness temperature calculator") simplified the process of analyzing nestedness, resulting in massive number of publications on the subject in many disciplines of ecology, including parasite ecology. The downturn in investigations of nestedness mirrored the upsurge in rapidity, and was brought about by several factors, including the recognition that passive sampling could produce nested subsets in almost any community, and the existence of a number of metrics of nestedness and a variety of null models that seemed to be arbitrarily packaged together in such a way that it required some skill in programming to match appropriate null models with metrics that had desirable characteristics. Although the death of the approach of finding nestedness for the sake of finding nestedness is a welcome one, nested subset analysis still has utility for examinations of parasite communities, particularly where host diet shifts or habitat shifts occur. An approach for testing for nestedness that addresses passive sampling by applying multiple null models, and its development as a package in R, will be described within the context of what parasite community questions could benefit from such an analysis.

46. **Assessing the role of the Pacific oyster *Magallana gigas* as a reservoir host for the dispersal of *Bonamia* (Haplosporida).** Hill-Spanik, Kristina M.[1], Rothkopf, Hannah[1,2], Allan Strand[1], Ryan B. Carnegie[3], James T. Carlton[4], Lucia Couceiro[5], Jeffrey A. Crooks[6], Hikaru Endo[7,8], Masakazu Hori[9], Mitsunobu Kamiya[10], Gen Kanaya[11], Judith Kochmann[12], Kun-Seop Lee[13], Lauren Lees[14], Massa Nakaoka[15], Eric Pante[16], Jennifer L. Ruesink[17], Evangelina Schwindt[18], Åsa Strand[19], Richard Taylor[20], Ryuta Terada[8], Martin Thiel[2], Takefumi Yorisue[22,23], Danielle Zacherl[24], Erik E. Sotka[1]. [1]College of Charleston, Grice Marine Laboratory, Charleston, SC; [2]Michigan State University, East Lansing, MI; [3]Virginia Institute of Marine Science, Gloucester Point, VA; [4]Williams College-Mystic Seaport Coastal & Ocean Studies Program, Mystic, CT; [5]Facultade de Ciencias, Universidade da Coruña, Coruña, Spain; [6]Tijuana River National Estuarine Research Reserve, Imperial Beach, CA; [7]Faculty of Fisheries, Kagoshima University, Kagoshima, Japan; [8]United Graduate School of Agricultural Sciences, Kagoshima University, Kagoshima, Japan; [9]Japan Fisheries Research and Education Agency, Yokohama, Kanagawa, Japan; [10]Tokyo University of Marine Science and Technology, Tokyo, Japan; [11]National Institute for Environmental Studies, Onogawa, Tsukuba, Japan; [12]Institute of Organismic and Molecular Evolution, Johannes Gutenberg University Mainz, Germany; [13]Pusan National University, Republic of Korea; [14]University of California, Irvine, CA; [15]Akkeshi Marine Station, Field Science Center

for Northern Biosphere, Hokkaido University, Akkeshi, Hokkaido, Japan; [16]Univ Brest, CNRS, IRD, Ifremer, UMR 6539, LEMAR, Plouzané, France; [17]University of Washington, Seattle, WA; [18]Instituto de Biología de Organismos Marinos (IBIOMAR-CONICET), Puerto Madryn, Argentina; [19]IVL Swedish Environmental Research Institute, department of Environmental Intelligence, Fiskebäckskil, Sweden; [20]University of Auckland, New Zealand; [21]Universidad Católica del Norte, Chile; [22]Institute of Natural and Environmental Sciences, University of Hyogo, Sanda, Hyogo, Japan; [23]Museum of Nature and Human Activities, Hyogo, Sanda, Hyogo, Japan; [24]California State University, Fullerton, CA.

Bonamia (Haplosporida) are protozoan oyster parasites capable of devastating oyster populations. The near-circumglobal distribution of the host-generalist *B. exitiosa* has previously been associated with the natural and anthropogenic dispersal of the broadly distributed, non-commercial oysters in the *Ostrea stentina* species complex. Here, we explore the role of the widely introduced Pacific oyster *Magallana gigas*, a commercially important species that can be found on every continent except Antarctica, in transporting *Bonamia*. We screened 938 individuals of *M. gigas* from 42 populations in this oyster's native (Japan, Korea) and non-native geographic range (South America (Chile, Argentina), Europe (Denmark, Norway, Sweden, France, Spain, Ireland), the west coast of North America (British Columbia, Washington, California), and New Zealand) for the presence of *Bonamia* DNA using PCR. *Bonamia exitiosa* was the only *Bonamia* species detected and only within two of five populations from Southern California, USA (10 and 42% PCR prevalence). We detected no *Bonamia* DNA within any other non-native M. gigas population (n = 302) nor within native M. gigas populations in Japan and Korea (n = 582). Our results suggest that M. gigas may have played a role in transporting and/or maintaining *B. exitiosa* in California, but we found no evidence to suggest it being responsible for the dispersal of any other *Bonamia* species.

47. **Otterly diverse - A high diversity of *Dracunculus* species (Spirurida: Dracunculoidea) in North American river otters (*Lontra canadensis*).** Yabsley, Michael J.[1], Kayla B. Garrett[1], Alec T. Thompson[1], Erin K. Box[1], Madeline R. Giner[1], Ellen Haynes[1], Heather Barron[2], Renata M. Schneider[3], Sarah M. Coker[1], James C. Beasley[1], Ernest J. Borchert[1], Renn Tumlison[4], Allison Surf[4], Casey G. Dukes[1], Colleen Olfenbuttel[5], Justin D. Brown[6], Liandrie Swanepoel[1], and Christopher A. Cleveland[1]. [1]University of Georgia, Athens, GA; [2]Clinic for the Rehabilitation of Wildlife, Sanibel, FL; [3]South Florida Wildlife Center, Fort Lauderdale, FL; [4]Henderson State University, Arkadelphia, AR; [5]North Carolina Wildlife Resources Commission, Raleigh, NC; and [6]Pennsylvania State University, University Park, PA.

In North America, there are at least three mammal-infecting species of *Dracunculus*. *Dracunculus* infections have been reported from river otters (*Lontra canadensis*) since the early 1900s; however, little is known about the species infecting otters or their ecology. Most Dracunculus reports do not have a definitive species identified because females, the most common sex found, lack distinguishing morphological characteristics, and few studies have used molecular methods to confirm identifications. Thus, outside of Ontario, Canada, where both *D. insignis* and *D. lutrae* have been confirmed in otters, the species of *Dracunculus* in river otters is unknown. In the current study, molecular characterization of nematodes from river otters revealed a high diversity of *Dracunculus* species. In addition to confirming *D. insignis* infections, two new clades were detected. One clade was a novel species and the other was a clade previously detected in Virginia opossums from the USA and a domestic dog from Spain. No infections with *D. lutrae* were detected and neither new lineage was genetically similar to *D. jaguape* from the neotropical otter from Argentina. These data also indicate that *Dracunculus* spp. infections in otters are widespread throughout Eastern North America. Currently life cycles for most *Dracunculus* spp. infecting otters are unknown. Studies on the diversity, life cycle, and natural history of Dracunculidae in wildlife are important because the related parasite, *D. medinensis* is the subject of an international eradication campaign and there are increasing

reports of these parasites in new geographic locations and hosts, including new species in humans and domestic dogs.

POSTER PRESENTATION ABSTRACTS

†P1. **The southern expansion of Lyme disease: examining pathogen dynamics in southwestern Virginia.** Aguirre, Aliya C., Leemu K. Jackson, and Elizabeth R. Gleim. Hollins University, Roanoke, VA.

Lyme disease is the most common vector-borne pathogen in the United States, with an estimated 476,000 cases occurring annually. In the United States, Lyme disease is caused by *Borrelia burgdorferi sensu stricto* which is vectored by the tick, Ixodes scapularis. Historically, Lyme disease has not been common in Virginia. However, there has been an increase in Lyme disease cases in western Virginia for the past 15 years that is associated with a southern expansion of Lyme disease. This study is working to determine the prevalence and common strain types of *B. burgdorferi sensu stricto* in I. scapularis collected in southwestern Virginia. Two hundred and ninety-one *I. scapularis* nymphs and 91 I. scapularis adults were tested. In nymphs, pathogen prevalence was 3.8%, whereas the adult pathogen prevalence was 35.2%. While the pathogen prevalence in nymphs is relatively low compared to other northeastern states, the adult pathogen prevalence is similar to the pathogen prevalence of other northeastern states. Overall, this likely indicates that Virginia is transitioning towards the pathogen establishing an endemic, sylvatic cycle. Work is currently underway to begin strain typing positive *B. burgdorferi sensu stricto* samples.

@P2. **A deeper look at hooks: Inter-relationships among neoechinorhynchid acanthocephalans.** Fleming, Morgan B. and Florian B. Reyda. State University of New York at Oneonta, Oneonta, NY.

Acanthocephalans are integral parts of ecosystems and can damage host populations. There is, however, an existing knowledge gap about most species of acanthocephalans. Many of them have yet to be analyzed using modern technology, including DNA sequencing. The key objective of this project is to increase our understanding of features of Family Neochinorhynchidae, a diverse group of ~150 acanthocephalans of fish and turtles that consists of 18 genera worldwide. The approach is to compare species of the 9 genera that occur in the United States using morphological data, with a focus on hook morphology, and DNA sequence data. The first phase of this project and the focus of this presentation is the survey work to obtain representatives of species of each of these 9 genera from at or near their type localities. As a result, we now have study sets of specimens of 8 of the 9 genera; a representative of the 9th genus will be obtained later this year. The samples acquired include *Tanaorhamphus longirostris* and *Gracilisentis gracilisentis* from Gizzard shad (*Dorosoma cepedianum*) from the Illinois River near Havana, Illinois; *Octospiniferoides chandleri* from Eastern mosquitofish (*Gambusia holbrooki*) from the Florida Everglades; *Floridosentis elongatus* from White mullet (*Mugil curema*) from coastal Florida; *Atactorhynchus verecundus* from Bolivar Peninsula, Texas; *Paulisentis missouriensis* from southeastern Nebraska; *Octospinifer macilentus* from localities in New York; various species of *Neoechinorhynchus* from various localities. This talk focuses on the specific results of field sampling and preliminary observations of the variable hook morphology represented by these genera.

†P3. **You Are What You Eat: Using molecular tools to study tapeworm life cycles in Young-of-the-year bull sharks *Carcharhinus leucas*.** Kennedy, Molly A., Allison Durland-Donahou, Melanie Langford, and Gabriel J. Langford. Florida Southern College, Lakeland, FL

Unraveling parasite life cycles is challenging under almost all conditions, even when many aspects of the host(s) and parasite can be manipulated in the laboratory. The challenge increases in marine ecosystems when studying host-parasite systems that cannot be maintained in controlled conditions. Given this limitation, it is unsurprisingly that the life cycles of parasites are unknown for most large marine hosts, such as sharks. Recently, studies have shown the usefulness of molecular tools as an alternative method for linking different organisms that likely serve as hosts for marine parasites. A variety of parasites, including tapeworms, are known to use bull sharks *Carcharhinus leucas* as their definitive host, but we know very little about the remainder of their life cycles. This study proposes to use molecular techniques to link intermediate hosts for *Cathetocephalus* sp. and *Paraorygmatobothrium* sp. that were collected from young-of-the-year bull sharks in the Alafia River estuary from Tampa Bay, Florida. It is hypothesized that these sharks are primarily preying upon hardhead catfish *Ariopsis felis* and striped mullet *Mugil cephalus*; and we have collected larval tapeworms from these potential intermediate hosts that we will attempt to molecularly match to our adult worms from the bull shark. Any results of this fledgling investigation will be presented at the meeting.

@P4. **Parasite prevalence and intensity in crab and shrimp hosts in two rivers of the Chesapeake Bay.** Khan, Amani F.[1], Amy E. Fowler[1], April Blakeslee[1], Kiersten Jewell[2], and Sarah R. Goodnight[1]. [1]George Mason University, Fairfax, VA; [2]East Carolina University, Greenville, NC.
Multi-host parasites such as digenean trematodes, which require multiple hosts in sequence to complete a life cycle, are integral components of estuarine ecosystems. Invertebrates like crabs and other arthropods commonly act as intermediate hosts, however, the host-level factors that govern parasite infection in these dynamic environments are frequently poorly understood. Here, we leverage several months of field-collected data to investigate how infection with other parasites (i.e., the rhizocephalan barnacle *Loxothylacus panopaei*) and host traits such as body size and sex predict trematode cyst infection load in white fingered mud crabs (*Rhithropanopeus harrisii*) and grass shrimp (*Palaemonetes pugio*) overwintering in low-salinity ecosystems. Hosts were collected once per month from October 2023 to February 2024 and dissected in the lab for quantification of host size, sex, and parasite infection. We observed a positive relationship between host size and infection load for both crabs and shrimp, likely due to larger hosts being older and accumulating multiple cohorts of cysts over time. Infection with *L. panopaei* rhizocephalans in crabs was also associated with higher cyst loads, potentially signaling coinfection facilitation; infection with *L. panopaei* may depress host immunity or compromise the protective exoskeleton, enhancing the crab's susceptibility to future infections of trematode cercariae (i.e., larvae) that penetrate host tissues to form cysts. Finally, male crabs had significantly higher infection loads of trematode cysts than female crabs. Male mud crabs may suffer from reduced immune responses resulting from higher aggressive activity and androgen hormone levels, potentially leading to this pattern. This study presents preliminary data from a planned year-long project investigating seasonal patterns in parasite population dynamics in estuarine invertebrates.

@P5. **Investigating *Ancylostoma caninum* growth rate in anthelmintic resistant and non-resistant strains.** Krawczyk, Elodie G., Hajar Errahmani, Catherine A. Jackson, Elise L. McKean, and John M. Hawdon. The George Washington University, Washington, DC.
Hookworm infections are a considerable burden in developing nations. Anthelmintic drug administration is the standard approach to controlling hookworms; however, multiple anthelmintic drug-resistant (MADR) populations of the canine hookworm *A. caninum* have emerged and spread widely due to widespread drug use. Our lab maintains a MADR isolate (BCR) that is resistant to the 3 major classes of anthelmintic. To determine if the drug resistance was associated with phenotypic differences, we investigated the growth rates of BCR and our susceptible isolate WMD. Eggs were isolated from feces by salt floatation. An equal number of eggs were plated onto nematode growth medium (NGM) agar plates seeded with *Escherichia coli* OP50. The plates were incubated at 28°C for up to one week. The nematodes were washed from the plate and stained with Lugol's iodine daily. Upon preliminary analysis of the results, we found the greatest discrepancy in isolate development occurs in the first two days. We then

repeated the experiment with nematode collection occurring at 18, 36, and 42 hours post-plating to further characterize the difference between isolates in early growth rate. Ten worms from each time point were photographed and measured. The WMD larvae develop more rapidly than BCR in the first 42 hours of incubation, with no BCR eggs hatching at hour 12 compared to the hatching WMD. More WMD L2 were present at 36 hours, but by 48 hours, differences in size and development were negligible. Our results suggest that growth differences between the resistant and susceptible isolates are minor.

@P6. ***Sarcocystis* incidence and distribution among *Canis latrans* in Eastern Illinois.**
Nuss, Faith J. and Elliot A. Zieman. Eastern Illinois University, Charleston, IL.
Sarcocystosis is a disease caused by single-celled protozoal parasites in the genus *Sarcocystis*. Known as rice breast disease in waterfowl, *Sarcocystis* spp. are common in tropical countries, with muscular *Sarcocystis* being commonly reported within Southeast Asia. For more than 150 species of *Sarcocystis*, parasites infect numerous species of vertebrates, such as *Canis latrans* (coyotes) and humans. The definitive hosts have intestinal *Sarcocystis* sp. infections, while intermediate hosts have sarcocysts in the muscle cells. However, compared to intestinal *Sarcocystis* (*S. hominis* and *S. suihominis*), reports of muscular *Sarcocystis* spp. within coyotes are scarce with only about four in literature. Two studies have reported muscular sarcocysts in captive coyotes infected with *S. hemionilatrantis* and *S. fusiformis*. All previous infections of North American sarcocystosis in coyotes have been documented from the western United States, with one study from Oklahoma, United States. In this study, we report the first case of *Sarcocystis* in coyotes as intermediate hosts, from the Midwest region of the United States. *Sarcocystic caninum* is suspected, as it is the only other species found intramuscularly within coyotes. The specimens were collected and documented from a licensed nuisance fur trapper/hunter from the eastern portion of Illinois. Muscle samples from 43 coyotes were screened microscopically for *Sarcocystis*, with a result of four positives. These results suggest that *Sarcocystis* is among coyotes from this region and would need to be further investigated.

‡P7. **Deciphering avian foraging behavior with parasite infracommunities.** Olsen, Ellie C., Kate L. Sheehan, and Cody J. Rowden. Frostburg State University, Frostburg, MD.
Parasite life-cycle information can fill in gaps in our understanding of predator-prey interactions in wildlife. Parasite communities in hosts' gastrointestinal tracts serve as biomarkers, validating prey consumption when direct observation or quantitative assessments are untenable. However, feeding interactions of wildlife on farmed products, like aquaculture, is crucial for defining the risks that wildlife pose to our food supply, and vice versa. As natural habitats are converted into aquaculture ponds, wading birds like herons, egrets, and grebes are enticed by abundant and readily accessible food resources. As such, their distributions are now linked with that of the aquaculture industry. However, it remains unclear whether wild birds are really a detriment to aquaculture. We investigated gastrointestinal helminthic parasites in 92 birds from freshwater shrimp farms in Alabama and Florida. While wading birds and pursuit divers incorporated farmed shrimp into their diets to some extent, these prey items were rare compared to other natural food sources and cohabitating aquatic species within shrimp ponds. The presence of trematodes like *Microphallus* sp. and acuarine nematodes suggests shrimp consumption occurs, but high intensities of *Diplostomum* sp. and *Apatemon* sp. indicate a preference for non-farmed prey like frogs and insects. Nonetheless, the avian hosts here carry parasites that could infect gastropods that occur in shrimp ponds. Understanding these interactions is vital to balancing any negative impacts on farmed resources with the potential benefits derived by supporting larger avian populations. By acknowledging these complexities, we can aim for harmonious coexistence between agriculture and wildlife conservation.

‡P8. **Prevalence of *Trypanosoma cruzi* in raccoons (*Procyon lotor*) and its associated risk to humans in central Illinois.** Onuselogu, Ozioma E. and Elliot A. Zieman. Department of Biological Sciences, Eastern Illinois University, Charleston, IL.

Chagas disease is a neglected tropical disease that poses a growing health threat in the United States. It is caused by the protozoan parasite *Trypanosoma cruzi*. Raccoons, which are known to coexist with humans in urban and suburban areas, serve as potential reservoir hosts for these parasites. This research investigated the prevalence of *T. cruzi* infection in raccoons to evaluate the potential risk of transmission in Central Illinois. Raccoon carcasses were obtained as roadkill or from a licensed wildlife trapper in both rural and urban areas. We employed a combination of molecular and histological techniques for the analysis of heart tissue samples from the raccoons. DNA extraction and PCR analysis were conducted on heart tissue samples obtained from 100 raccoons. The initial gel electrophoresis results indicated the presence of T. cruzi parasite in the tested raccoons. Our findings have the potential to provide vital information on the epidemiology of Chagas disease in Central Illinois and lay the foundation for developing targeted surveillance and control measures, with the aim of preventing parasite transmission to humans in Central Illinois.

†P9. **Great Egret foraging habits from trophically transmitted endoparasites.** Rowden, Cody J., Kate L. Sheehan, and Ellie C. Olsen. Frostburg State University, Frostburg, MD.
Wading birds congregate on aquaculture facilities, sometimes foraging on farmed products, and other times, consuming natural food sources nearby. While some waterbirds are suggested to be generalist feeders, individuals within a subpopulation exhibit more specialized diets. The infracommunities of trophically transmitted parasites indicate the feeding habits of avian definitive hosts. Further, in final hosts, parasites do not replicate, and the individual counts of parasitic taxa can tell us about the frequency of intermediate hosts that a bird has consumed. Culled Great Egrets (GREG) from shrimp aquaculture ponds were processed for intestinal helminths, where preserved digestate was scrutinized for trophically-transmitted parasites present. In the 50 birds assessed here, we found more than 9400 individual parasites, belonging to 17 estimated morphospecies. Despite the high overall richness, we found that the average GREG was host to only 3.3 spp. of parasite (min = 1, max = 6). Further, we found little evidence of differentiation in the diversity (H') of endoparasite communities. Acanthocephalans infected 22% of hosts, cestodes infected 28%, nematodes infected 28% and trematodes were found in 82% of GREGs evaluated here. The most frequently encountered parasite was a diplostomatid (n ~ 8000) in no other bird species collected from the same ponds. Our results suggest that, while GREG can consume a wide variety of prey, individuals appear to be more specific in their feeding habits. Using parasites as ecological indicators of host behavior is an intriguing tool for learning about the foraging breadths and specificities of individuals and populations.

@P10. **Finding Dory (*Neoechinorhynchus doryphorus*): Van Cleave and Bangham's mystery worm rediscovered in the Florida Everglades.** Sawickij, Katerina, Madison Stanley, and Florian Reyda. State University of New York at Oneonta, Oneonta, NY.
A survey of intestinal parasites of freshwater fish was conducted across the eastern portion of the Everglades, Florida from May to August 2023. Seven hundred and fifteen fish from 31 species were investigated from 13 sites across three water bodies designated as storm water treatment areas or water conservation areas as well as Lake Okeechobee and surrounding water bodies. Fish were collected through various sampling means and their intestines were examined for parasites in conjunction with a collaborator in Florida. A new species of *Neoechinorhynchus* was documented from *Micropterus* sp.. While the species strikingly resembles the well-known and widely reported centrarchid neoechinorhynchid *Neoechinorhynchus cylindratus* it differs in 2 key features. The proboscis of the new species is markedly wider than that of *N. cylindratus*. The most distinctive feature of the new species is, however, egg morphology. The eggs of the new species resemble those of many other species of *Neoechinorhynchus* in their possession of polar prolongations of the fertilization membrane but differ in that ends of the prolongations expand into a crown-like structure, a unique feature in the diverse genus. A second species of *Neoechinorhynchus* was also documented from

Micropterus sp., the poorly-known previously described *Neoechinorhynchus doryphorus* that was described by Van Cleave and Bangham in 1949 based on poor material and not observed since. We provide additional morphological data on *N. doryphorus*. The 3rd acanthocephalan encountered is a species of *Neoechinorhynchus* from the Mayan cichlid, *Mayaheros uropthalmus*, which constitutes a new locality record.

P11. ***Curcuma domestica* reverses neurological complications in Malaria.** Falade, Mofolusho[1], Amany D. Ladagu[2], and Benson Otarigho[3]. [1]Transylvania University, Lexington, KY; [2]University of Ibadan, Ibadan, Nigeria; and [3]Department of Genetics, MD Anderson Cancer Center, Houston, TX.

Antimalarials derived from plants, such as quinine and artemisinin, have significantly reduced the burden of severe malaria (SM). However, the rise of antimalarial drug resistance has complicated SM treatment. Developing new effective drugs and adjunctive therapies for SM is crucial. Some natural products, like curcumin from *Curcuma* species, have shown promise in treating malaria-related neurological complications. This study used a murine model of SM to assess the efficacy of *Curcuma domestica* rhizome in reversing *Plasmodium berghei* SM pathology. It evaluated parasitemia, animal survival, and immunomodulatory activities of ethanolic extracts of *Curcuma domestica* in young mice infected with *P. berghei*. Results showed that the highest concentration of *C. domestica* reduced parasitemia, reversed neurological complications, and prolonged survival in treated mice ($P < 0.05$). Treatment also minimized extravasation of Evans blue dye in the brain, indicating an intact blood-brain barrier. Histological examination revealed reduced apoptotic neurons, while immune assays indicated reduced brain inflammation and oxidative stress resolved by *C. dometica* treatment. This study highlights *C. domestica*'s potential as a novel antimalarial and immunomodulatory candidate for treating malaria-related neurological complications. The findings support further exploration of *C. domestica* as a potential adjunctive therapy for severe malaria, emphasizing the role of natural products in addressing the global health challenge of Malaria.

P12. **An investigation of genetic diversity across life stages of two trophically transmitted trematode parasites.** Goodnight, Sarah R.[1], April M. Blakeslee[2], and Michael W. McCoy[3]. [1]George Mason University, Woodbridge, VA; [2]East Carolina University, Greenville, NC; and [3]Florida Atlantic University, Fort Pierce, FL.

Complex life cycles are common across parasite taxa and frequently require trophic transfer of parasites from prey to predator, resulting in highly aggregated distributions of parasites in high-trophic level host populations. Parasite genetic diversity is thus strongly tied to host ecology and transmission dynamics, and individual predator or “downstream” hosts are expected to contain more genetically diverse parasite infrapopulations than upstream hosts. To examine how parasite life history and host ecology influence parasite genetic patterns, we characterized the genetic diversity of within-host infrapopulations, as well as overall population genetic structure, of sympatric tongueworm (*Halipegus occidualis*) and lungworm (*Haematoloechus complexus*) freshwater parasite populations. Infection load and genetic diversity of host-level parasite infrapopulations increased with host trophic level, as expected, highlighting how trophic transfer and multi-host life cycle structure may benefit parasites by increasing genetic diversity at the sexually reproducing adult stage. We also found that tongueworm populations, which infect a long-lived snail as a first intermediate host, had higher population-level genetic diversity than lungworms, which infect a much shorter-lived snail with highly unstable population dynamics characterized by yearly die-offs. Thus, we hypothesize that first intermediate host population dynamics and dispersal ability play a role in predicting population-level parasite genetic diversity and structure.

P13. **Seasonal consumption of microplastics and their impacts on infrapopulations of parasites.** Held, Andrew, R. and Kate L. Sheehan. Frostburg State University, Frostburg, MD.

Migratory species encounter a myriad of environmental conditions as they move throughout their ranges. In addition to interactions with a variety of intermediate hosts that can transfer parasites, migratory individuals also can interact with environmental contaminants, like microplastic pollution. Here, we assessed waterbirds (Double-crested Cormorants: DCCO and Lesser Scaup: LESC) collected from baitfish ponds in the southern US throughout the year. We found that birds arriving in their non-breeding territories contained more microplastics than those that had been present in their non-breeding range for several months, suggesting that their northern breeding areas contained more contaminants than the aquaculture ponds where they winter. Additionally, we find differences in the frequencies of plastic contaminants between species, and the frequencies of parasites that infect migratory birds. Despite the temporal trends observed in plastic consumption, it appears that parasite frequencies remained consistent among seasons, suggesting that, while migratory birds interact with aquaculture facilities in their non-breeding season, they continue to also interact with prey that are similar to those, from a host-parasite perspective, that are available in their northern breeding habitats.

P14. **Unveiling avian forage habit through parasitic infracommunities: a case study of Great Egrets (*Ardea alba*) in aquaculture environments.** Rowden, Cody J. and Sheehan, Kate L. Frostburg State University, Frostburg, MD.

Because they have a difficult time using matches, most wild animals do not cook their food. Consequently, they are exposed to parasitic infections with nearly every meal they take. Thus, the infracommunity of trophically transmitted parasites indicates the feeding habits of their avian definitive hosts. Additionally, in these hosts, the parasites do not multiply, so the counts of whole parasites within the gut contents of their definitive hosts can tell us about the frequency of their consumption of the intermediate hosts. The community assemblages within avian definitive hosts are a window into their individual diets. Many bird species are categorized into feeding groups, where some consume seeds, insects, fishes, or aquatic invertebrates, but this specialization is not necessarily the case in large-bodied species like gulls and wading birds. Instead, these birds are often considered as generalist foragers. However, individuals within these generalist foragers are potentially specialists. Parasite communities are a useful way to test the hypothesis: that individuals of a generalist forager species exhibit specialist tendencies. We can evaluate this by comparing the diversity and community compositions of individuals vs. the species. We have assessed the endoparasite communities of Great Egrets (*Ardea alba*) that were collected off aquaculture facilities. Parasites recovered include trematodes (Digenea: Platyhelminthes) from the strigeid and diplostomatid families, acanthocephalans, various cestodes, and capillarid and anisakid nematodes. Using combinations of their alpha and gamma diversities, their raw/ranked counts, and a chi-square test we can learn whether some egrets were consuming certain intermediate host prey more frequently than others.

P15. **Trichomonad disease in wild turkeys (*Meleagris gallopavo*): pathology and molecular characterization of *Histomonas*, *Tetratrichomonas*, *Tritrichomonas* and *Simplicimonas* species.** Adcock, Kayla G.[1], Alisia A. Weyna[1], Michael J. Yabsley[1], Rowen E. Bäck[2], Kayla B. Garrett[1], Kevin D. Niedringhaus[1], Melanie R. Kunkel[1], Heather M. A. Fenton[1], Kevin M. Keel[1], Charlie S. Bahnson[1], Elizabeth Elsmo[1], and Nicole M. Nemeth[1]. [1]University of Georgia, Athens, GA and [2]University of Tennessee, Knoxville, TN.

The wild turkey (*Meleagris gallopavo*) is a geographically widespread, popular game bird and conservation icon in North America. However, regional declines have fueled population health concerns. Understanding mortality causes and spatiotemporal disease patterns is important to uncover potential ongoing and future health risks. Histomonosis, caused by the trichomonad *Histomonas meleagridis*, is a potentially fatal disease in turkeys; however, prevalence and population health impacts are understudied. Moreover, molecular tools have allowed for the detection of additional trichomonads that also cause disease. We describe disease due to *H. meleagridis* with that of *Tetratrichomonas gallinarum*, *Tritrichomonas* sp., and *Simplicimonas* sp. in wild turkeys in the southeastern U.S. Among 857 turkeys evaluated postmortem from 2002-

2023, 34 (4.0%) were diagnosed with trichomonad disease, often assumed to be histomonosis prior to molecular testing. However, among 25 debilitating to fatal trichomonad disease cases for which etiologies were confirmed by PCR from 2015-2023, *H. meleagridis* was detected in 64.0%, *Tetratrichomonas gallinarum* in 24%), *Tritrichomonas* in 8% and *Simplicimonas* in 4%. Turkeys had similar clinical manifestations and although lesion patterns varied, liver and/or intestinal tract were most commonly affected. Coinfections were common among all turkeys with trichomonad disease from 2015-2023 (21/25 [84.0%]), and included viruses (lymphoproliferative disease virus, avian poxvirus), bacteria (*Streptococcus gallolyticus*, *Listeria monocytogenes*, *Escherichia coli*) and other protozoa (*Sarcocystis* sp., and *Haemoproteus* sp.). Our results highlight the importance of molecular diagnostic testing. Further evaluation of the epidemiology and pathogenesis of trichomonad disease and its varied etiologies is warranted to better understand risk factors and potential health impacts.

P16. **On the identity of a problematic set of *Neoechinorhynchus* specimens from buffalo (Catostomidae) from Illinois.** Picozzi, Timothy F., Jessica E. Ozner, and Florian B. Reyda. State University of New York at Oneonta, Oneonta, NY

Three species of *Neoechinorhynchus* (Acanthocephela) were described by Van Cleave from Buffalo fishes (Catostomidae: *Ictiobus*): *Neoechinorhynchus australis*, *Neoechinorhynchus distractus*, and *Neoechinorhynchus strigosus*. During surveys conducted in 2017 and 2019 we were unsuccessful in obtaining these species from their type hosts in their type localities in Mississippi and Tennessee. In 2023 however, we were successful in obtaining a currently unidentified species of *Neoechinorhynchus* from *Ictiobus bubalus* from Illinois. Our specimens most closely resemble *N. strigosus*. However, there are differences between the type series of *Neoechinorhynchus strigosus* and our specimens from 2023. Importantly, Van Cleave reported in 1949 that mature females of *Neoechinorhynchus strigosus* have a trunk length ranging from 9 to 14.1 mm, with males ranging from 3.5 to 5.5 mm. Our 2023 female specimens, conversely, range from 17.5 to a startling 27 mm, almost double that of the type series of *N. strigosus*. Males follow this trend, with our only sample measuring 9 mm. There are also discrepancies with the egg length and width, but this metric can be affected by different fixation approaches and is currently under analysis. Additionally, we are investigating the conspecificity of the two sets of specimens used by Van Cleave to describe *N. strigosus* given that one set came from *Ictiobus* sp. from Tennessee whereas the other set came from *Catostomus commersonii* from Wisconsin. We plan on continuing our morphological comparisons, with the eventual goal of determining if *N. strigosus* requires a redescription or if we have discovered a new species of *Neoechinorhynchus*.

Helminthological Society of Washington Discrimination Policy

Statement of Policy
The Helminthological Society of Washington (HSOW) is committed to providing an environment for meeting participants that is conducive to the free and robust exchange of scientific ideas, and free from discrimination, harassment, and retaliation. The HSOW will not tolerate actions, statements, or contacts that discourage the free expression and exchange of scientific ideas. This includes unequal treatment or harassment of any person based on their age, sex, gender identity or expression, marital status, sexual orientation, race, color, national or ethnic origin, religious identifications, beliefs or practices, disabilities, veteran status, or any other reasons or expressions that are unrelated to their scientific merit. Harassment, sexual or otherwise, shall be considered a form of misconduct and violators will be subject to disciplinary actions, including expulsion from a society function or from the society itself.

Definition of Sexual Harassment:
Sexual harassment refers to unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature. Sexual harassment does not refer to occasional compliments of a socially acceptable nature. It refers to behavior that is not welcome, is personally offensive, debilitates morale, and therefore, interferes with a collegial atmosphere. The following are examples of behavior that, when unwelcome, may constitute sexual harassment: sexual flirtations, advances, or propositions; verbal comments or physical actions of a sexual nature; sexually degrading words used to describe an individual; a display of sexually suggestive objects or pictures; sexually explicit jokes; unnecessary touching. What is perceived as acceptable to one person may be unwelcome by another. Those who have positions of authority or higher rank should be aware that others may be reluctant to outwardly express objections or discomfort regarding unwelcome behavior or language.

Other Types of Harassment:
Remarks and behaviors based on other protected characteristics are also unacceptable to the Society. These include stereotyping, slurs, derogatory jokes or statements, and any hostile or intimidating acts. Within the context of this policy and professional practices, critical examination of beliefs and viewpoints does not, by itself, constitute hostile conduct or harassment.

Policy Scope:
This policy applies to all attendees and participants at HSOW meetings and functions, including social functions, tours, or off-site activities during the course of meetings and functions, and includes all members, guests, staff, contractors, and exhibitors.

Reporting an Incident:
If any individual covered by this policy believes that they have experienced or witnessed harassment or bullying they should report the event to HSOW's President or Vice-President; if both of those persons are implicated in the complaint, report or inquiry, it should be directed to the Corresponding Secretary/Treasurer or the Recording Secretary. The individual(s) lodging a complaint will be asked to provide details of the incident or incidents, names of individuals involved and names of any witnesses. Written complaints are preferred, but it is not mandatory. Complaints may be made on a confidential or anonymous basis, but please note that enough detail is needed to proceed or act on a concern. No complainant will be required to discuss any incident with the alleged offender, and no alleged offender will be required to discuss any incident with a complainant. All individuals (complainant or respondent) may bring an accompanying individual of their choice with them for support at any point when they discuss the matter with the society's representative, or during any course of an ensuing investigation. Regardless, a complainant may speak in confidence with the society's representative without an official report, an investigation or an alleged offender. All received complaints will be treated

seriously, and will be addressed promptly if that is the wish of a complainant. Any incidents of sexual assault should be reported to the police immediately. Note that many local and regional governments also consider a variety of behaviors to be reportable crimes regardless of the wishes of the complainant, respondent or of the society.
The complaint will be referred to the Executive Committee (excluding those who might be implicated in the complaint) for initial evaluation. The initial evaluation will address whether there is sufficient information to pursue the claim further, whether the alleged behavior is serious in nature and meets the criteria identified in this policy, and whether it might be resolved through a less formal means.
Because allegations of discrimination, harassment and misconduct are sensitive matters with the potential to negatively impact the reputation of individuals, institutions, and/or our Society, confidentiality and discretion throughout the process is expected from all parties involved and is assured from the HSOW's representative and all involved in the investigation.

Investigation:
Following the official report of an incident, where deemed appropriate and only with the approval and cooperation of the complainant(s), the Executive Committee will promptly and impartially initiate an investigation. Insofar as practicable and consistent with legal process and full and effective investigation, every effort will be made to maintain confidentiality of the complainant(s) and the individual(s) implicated in the complaint. However, confidentiality cannot be guaranteed (for example, although efforts will be made to reduce the chances, it may be possible to infer something about the person(s) involved based upon the situation under question).
The HSOW Executive Committee may name an impartial investigator, usually an elected officer or Executive Committee member(s), and the respondent will be promptly notified. No one who has a conflict of interest with respect to the complainant or respondent will serve in this role. The investigator is allowed to seek counsel if they are in doubt as to how to proceed, or if necessary, the Executive Committee can hire an independent investigator.
During an investigation, the investigator *generally* will do the following (as necessary) to make a determination as to appropriate action:

· document the nature of the complaint
· interview the complainant
· conduct further interviews as necessary, such as with witnesses or, at an appropriate time, the alleged offender
· document the investigator’s findings regarding the complaint · document recommended follow-up actions and remedies, if warranted · inform the complainant of investigator’s findings.

Upon completion of an investigation, the results will be shared with the full Executive Committee (excluding those who might be implicated in the complaint). If disciplinary action is being considered, those who are implicated in the completed investigation will have an opportunity to appeal to the Executive Committee before a disciplinary action is made. Disciplinary actions by the Executive Committee could range from a conversation with the person, a formal written warning, or for particularly egregious or repeated incidents, barring the person from attending workshops or sessions or even a recommendation to revoke the person's HSOW membership. All disciplinary decisions by the Executive Committee will be final.
Notwithstanding, HSOW reserves the right, upon receipt of a complaint, if in HSOW’s sole reasonable discretion, the nature of such complaint requires the immediate removal of an individual in order to ensure that Event may proceed safely and without undue interruption, to remove an individual without undertaking an investigation as described herein.

Retaliation:
The Society will not tolerate any form of retaliation against individuals who report an incident, against those who are subject to a complaint, nor against those who participate in an

investigation. Retaliation will be considered a form of discrimination in and of itself, and offenders will be subject to disciplinary action, up to and including ejection from the society. If an individual harasses, retaliates, or knowingly makes a false claim, they will be subject to disciplinary action. These actions might range from a verbal warning to a request to leave the meeting or function without refund of fees and a reporting of the incident to the person's employer. Should repeated complaints, patterns of inappropriate behavior, or other events emerge, the society's by-laws permit the Executive Committee to exclude and eject members through a process that has no appeal.

Appeal & Questions:
Should any person be dissatisfied with the result of an investigation or disciplinary action, they may appeal to the President of the Society, or to the highest-ranking officer without a conflict of interest. Questions concerning the policy should be directed to an HSOW officer or a HSOW Executive Committee member.

Records Retention:
Records are to be retained until final disposition of charges or resolution of any related lawsuit.

SOUTHEASTERN SOCIETY OF PARASITOLOGISTS CONDUCT POLICY

Statement of Policy

The Southeastern Society of Parasitologists (SSP) will afford an environment free from discrimination, harassment, and retaliation. The SSP will not tolerate actions, statements, or contacts that discourage the free expression and exchange of ideas. This includes unequal treatment or harassment of any person based on their age, gender, gender identity or expression, marital status, sexual orientation, race, color, national or ethnic origin, religious identifications, beliefs or practices, disabilities, political affiliation, veteran status, or any other identity. Harassment, sexual or otherwise, shall be considered as a form of misconduct and violators will be subject to disciplinary actions, including, but not limited to, expulsion from a society function or from the society itself.

Definition of Sexual Harassment

Sexual harassment refers to unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature that are not consensual. It refers to behavior that is not welcome, is personally offensive, creates an unsafe environment, debilitates morale, and, therefore, interferes with a collegial atmosphere. The following are examples of behavior that, when unwelcome, may constitute sexual harassment: sexual flirtations, advances, or propositions; verbal comments or physical actions of a sexual nature; sexually degrading words used to describe an individual; a display of sexually suggestive objects or pictures; sexually explicit jokes; unnecessary touching. What is perceived as acceptable to one person may be unwelcome by another. Individuals may be reluctant to outwardly express objections or discomfort regarding unwelcome behavior or language; therefore, it is recommended that all members maintain a high standard of professionalism where peers are treated with respect.

Other Types of Harassment

Remarks and behaviors based on other protected characteristics are also unacceptable to the Society. These include stereotyping, slurs, derogatory jokes, or statements, and any hostile or intimidating acts.

Policy Scope

This policy applies to all attendees and participants at officially sanctioned SSP meetings and functions, including social functions, tours, or off-site activities, and include all members, guests, staff, contractors, and exhibitors.

Reporting an Incident

If any individual covered by this policy believes that they have experienced or witnessed harassment or bullying they should contact the SSP President or President-Elect (hereon, the Society's designated individuals). This initial contact would not constitute a formal complaint unless the complainant explicitly stated otherwise in writing. No complainant will be required to discuss any incident with a respondent, no respondent will be required to discuss any incident with a complainant. All individuals (complainant or respondent) may bring an accompanying individual of their choice with them for support at any point when they discuss the matter with the Society's designated individual/s, or during any course of an ensuing investigation.
Because allegations of discrimination, harassment, and misconduct are sensitive matters with the potential to negatively impact the reputation of individuals, institutions, and/or our Society, confidentiality and discretion throughout the process is expected from all parties involved and is assured from the Society's designated individuals and all involved in the investigation with the exception that the Society designated individual that was initially contacted may confidentially consult with the other Society designated individual and/or SSP Council if deemed necessary by the Society designated individual that was initially contacted. In the event that one of the

society designated individuals is the complainant or respondent, the other society designated individual may confidentially consult with another officer of the Society. Regardless, a complainant may speak in confidence with the Society's designated individuals without involving the respondent, an official report to the Society or investigation by the Society. All complaints that are received will be treated seriously and will be addressed promptly if that is the wish of the complainant. Complainants will be encouraged to report to the police any incidents of sexual assault. Note, however, that many local and regional governments consider a variety of behaviors to be reportable crimes regardless of the wishes of the complainant, respondent, or of the Society and that the Society and its officers will comply, to the best of their knowledge, with any reporting laws.

Should the complainant wish for the Society to initiate a formal investigation into the alleged discrimination, harassment, or misconduct, the complainant should e-mail the society's designated individual and state that they would like to officially report an incident and have the Society launch a formal investigation. The Executive Committee of SSP will be notified by the society's designated individual that a formal complaint has been received and that an investigation will be launched but no additional information, such as the names of complainants or respondents or details of the event, will be disclosed.

Investigation
Following the official report of an incident and the official request of an investigation, the Society's designated individual/s, in consultation with SSP Council, will name an impartial investigator, usually an elected officer or Council member, and the respondent will be promptly notified. No one who has a conflict of interest with respect to the complainant or respondent will serve in this role. A complainant will be asked to file a formal written complaint form which the investigator will provide. The respondent will be notified immediately and prior to any discovery procedures. A respondent will be invited to respond to the complaint and allowed to bring evidence. The Council of the Society and/or the investigator reserves the right to interview other individuals as witnesses at its own discretion. The investigator is allowed to seek counsel if they are in doubt as to how to proceed. When the investigation is complete, the findings will be communicated to the elected officers, as well as both to the complainant and respondent. Those officers without a conflict of interest will decide on appropriate disciplinary actions. Officers would be deemed to have a conflict of interest if they worked at or attended the same institution as the complainant or respondent, were in a romantic relationship with the complainant or respondent, or any other instance in which the majority of the officers or SSP Council agreed that there was a conflict of interest.

Retaliation
The Society will not tolerate any form of retaliation against individuals who report an incident, against those who are subject to a complaint, nor against those who participate in an investigation. Retaliation will be considered a form of discrimination in and of itself and as such, can be reported (see Reporting an Incident). Offenders found to have retaliated will be subject to disciplinary action, up to and including ejection from the Society.

Disciplinary Action
If an individual is found to have harassed, retaliated, or knowingly made a false claim, they will be subject to disciplinary action. These actions might include a verbal warning, a request to leave the meeting or function without refund of fees, and/or ejected from the SSP.

Appeal & Questions
Should any person be dissatisfied with the result of an investigation or disciplinary action, they may appeal to the President of the Society, or to the highest-ranking officer without a conflict of interest. Questions concerning the policy can be directed to an SSP officer or the SSP

designated individual.

Expected Behavior

- Treat all participants with respect and consideration.
- Be considerate, respectful, and collaborative.
- Communicate openly with respect for others, critiquing ideas rather than individuals.
- Avoid personal attacks directed toward others.
- Be mindful of your surroundings and of your fellow participants.
- Respect the rules, policies, and property of the meeting venue and SSP.

Unacceptable Behavior

- Harassment, intimidation or discrimination in any form.
- Physical or verbal abuse.
- Disruption of talks at oral or poster sessions.
- Examples of unacceptable behavior include, but are not limited to, verbal comments related to gender, sexual orientation, disability, physical appearance, body size, race, religion, national origin, inappropriate use of nudity and/or sexual images in public spaces or in presentations, threatening or stalking.

We are grateful for the meeting support provided by:

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&

The Virginia Military Institute

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Hollins University