Kelly M. Diamond

Postdoctoral Research Fellow
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Education

2015-2019 Ph.D. Biological Sciences, Clemson University, Clemson, SC
Functional morphology and environmental impacts on migration-related performance in amphidromous goby fishes

2013-2015 M.S. Biological Sciences, Clemson University, Clemson, SC
Environmental effects on fish escape responses: impact of flow on the escape performance of the Hawaiian stream goby, Sicyopterus stimpsoni

2009-2013 B.S. Biology, University of Central Florida, Orlando, FL
Phylogenetic relationships and morphological variation in pitviper taxa

Professional Appointment

2020-Present Postdoctoral fellow, Seattle Children's Research Institute, Seattle, WA
Mentor: A. Murat Maga (NSF award #1939505)
Biology Guided Neural Networks (National Science Foundation sponsored collaborative project supported by the Harnessing the Data Revolution, a project under the Office of Advanced Cyberinfrastructure)
Goal: Using biology-guided machine learning on open-source image datasets to answer questions in ecology and evolution.

Publications

ORCID: 0000-0001-8639-6795 *Undergraduate coauthor, ‡ International Collaborator

11. Rolfe S, Pieper S, Porto A, **Diamond KM**, Winchester J, Shan S, Kirveslahti H, Doug Boyer D, Summers A, Maga AM. SlicerMorph: An open and extensible platform to retrieve, visualize and analyze 3D morphology. *Methods in Ecology and Evolution. In press*
Preprint available: https://doi.org/10.1101/2020.11.09.374926

10. **Diamond KM**, Lagarde R‡, Griner JG*, Powder KE, Schoenfuss HL, Walker JA, Ponton D‡, Blob RW. Interactions among multiple selective pressures decouple the form-function relationship in stream fishes. *Biological Journal of the Linnean Society. In press*

9. Forker GK*, Schoenfuss HL, Blob RW, **Diamond KM**. Bendy to the bone: links between vertebral morphology and waterfall climbing in amphidromous gobioid fishes. Journal of Anatomy. *In press*

8. Schneider NG*, McDamy AJ*, Rubin AM*, Schoenfuss HL, Blob RW, **Diamond KM**. Do predators take advantage of prey blind spots? In-stream analysis of predator-prey interactions in Hawaiian stream fishes. *Ichthyological Explorations of Freshwaters*. *In press*

7. Leipzig J, Bakis Y, Wang X, Elhamod M, **Diamond KM**, Dahdul W, Karpatne A, Maga AM, Mabee P, Bart HL, Greenberg J. 2021. Biodiversity image quality metadata augments convolutional neural network classification of fish species. *International Conference on Metadata and Semantics Research*. *In press*
Preprint available: https://doi.org/10.1101/2021.01.28.428644

6. Blob RW, Baumann T, **Diamond KM**, Young VKH, Schoenfuss HL. 2020. Functional correlations of axial muscle fiber type proportions in the waterfall-climbing Hawaiian stream fish *Sicyopterus stimpsoni*. *Journal of Anatomy*. 236:1160–1166. https://doi.org/10.1111/taja.13169

5. **Diamond KM**, Lagarde R‡, Schoenfuss HL, Walker JA, Ponton D‡, Blob RW. 2019. Ontogenetic change in escape behavior and performance of fishes experiencing different predator regimes. *Biological Journal of the Linnean Society*. 127: 324-336. https://doi.org/10.1093/biolinnean/blz055

4. Blob RW, Lagarde R‡, **Diamond KM**, Keeffe RM*, Bertram RS, Ponton D‡, Schoenfuss HL. 2019. Functional diversity of evolutionary innovations: insights from waterfall-climbing kinematics and performance of juvenile gobiid fishes. *Integrative Organismal Biology*. Obz029. https://doi.org/10.1093/iob/obz029

3. Taft NK, Taft BN, Henck H, **Diamond KM**, Schoenfuss HL, Blob RW. 2017. Comparative morphology and mechanical properties of the lepidotrichia of climbing and non-climbing Hawaiian gobioid fishes. *Cybium*. 41(2): 107-115.

2. **Diamond KM**, Schoenfuss HL, Walker JA, Blob RW. 2016. Flowing water affects fish fast-starts: escape performance of the Hawaiian stream goby, *Sicyopterus stimpsoni*. *Journal of Experimental Biology*. 219: 3100-3105. http://jeb.biologists.org/content/219/19/3100

1. **Diamond KM**, Trovilion D, Allen KE, Malela KM, Noble DA, Powell R, Eifler D, Gifford ME. 2014. Individual (co)variation in locomotor performance and field behavior in Curly-tailed Lizards, *Leiocephalus carinatus*. *Journal of Zoology*. 294: 248-254. http://onlinelibrary.wiley.com/doi/10.1111/jzo.12175/full

Preprints & Submitted Publications

ORCID: 0000-0001-8639-6795 *Undergraduate coauthor, ‡ International Collaborator

Diamond KM, Rolfe SM, Kwon RY, Maga AM. Computational anatomy and geometric shape analysis enables analysis of complex craniofacial phenotypes in zebrafish mutants. *Biology Open. In revision*
Preprint available: https://doi.org/10.1101/2021.02.12.431035

Elhamod M, **Diamond KM**, Maga AM, Bakis Y, Bart HL, Mabee P, Dahdul W, Leipzig J, Greenberg J, Avants B, Karpatne A. Hierarchy-guided neural networks for species classification. *Methods in Ecology and Evolution. In revision*
Preprint available: https://www.biorxiv.org/content/10.1101/2021.01.17.427006v1

Diamond KM, Good CJ*, Johnny N, Sakihara TS, Edmison PL, Faust JA, Schoenfuss TA, Rubin AM*, Blob RW Schoenfuss HL. Pollution in paradise: assessing occurrences and biological consequences of contaminants of emerging concern on oceanic islands. *Environment International. In review*

McAlpine-Bellis EA*, Utsumi KL*, Klein JRV*, **Diamond KM**, Gilbert-Smith S*, Garrison GE, Eifler M, Eifler D. Movement patterns and habitat use for sympatric species with differing prey detection strategies. *Herpetologica*. *In revision*

Grants, Fellowships, and Awards

2020 Postdoctoral Research Fellowship, supported by the Biology Guided Neural Networks (A. Murat Maga NSF #1939505)

2019 Vision Research Corporation, Phantom Camera Education Challenge – Awarded equipment usage for filming high speed videos of fish escape responses and climbing trials (eq. $11,340)

2019 Clemson Professional Enrichment Grant ($1000)

Clemson Professional Development Grant for Graduate Student Research ($1000)

Biological Sciences Graduate Student Association, Travel Award ($300)

Alfred 'Hap' Wheeler Distinguished BSGSA Member Award

2018 American Philosophical Society, Lewis & Clark Fund for Exploration & Research ($4300)

American Museum of Natural History, Theodore Roosevelt Memorial Fund fellowship ($3413)

Findley Student Assistance Endowment ($1500)

Clemson Professional Enrichment Grant ($648)

2017 Society for Integrative and Comparative Biology Fellowship of Graduate Student Travel ($2000)

Biological Sciences Graduate Student Association, Travel Award ($400)

Clemson Professional Enrichment Grant ($750)

Biological Sciences Graduate Student Association Commitment to Service

2016 American Society of Ichthyologists and Herpetologists, Edward C. Raney Grant ($800)

Biological Sciences Graduate Student Association, Travel Award ($400)

Clemson Professional Enrichment Grants ($750, $302, $414)

2015 Biological Sciences Graduate Student Association, Travel Award ($300)

2014 Sigma Xi Grant-in-Aid of Research ($1000)

Clemson Professional Enrichment Grant ($650)

Biological Sciences Graduate Student Association Commitment to Research

2012 Student Government Association Travel Award ($300)

2011 Innovation through Institutional Integration Fellowship (2011-2013)

2010 Research and Mentoring Program Scholarship (2010-2011)

Work Force Central Florida Grant for Undergraduate Research

2009 Florida Bright Futures Scholarship (2009-2013)

Teaching and Leadership Experience

2020-Present Advisory Board Member, Erell Institute
Advise on projects and future directions for the non-profit research institute

2020-2021 SlicerMorph Workshop Instructor
Introduction to using SlicerMorph for collecting morphological measurements

2017-2020 Mentor, Erell Institute
Develop research projects with pre-graduate students

2018-2019	Founding member of Clemson University, College of Science Outreach Team *Organized science themed community events*
2016-2019	Mentor, New Foundations foster home for children *Worked one on one with a high school student to encourage learning and self esteem*
2014-2019	Creative Inquiry Mentor, Clemson University *Trained and oversaw independent projects of 9 undergraduate students*
2013-2019	Graduate teaching assistant. Clemson University *Labs: Vertebrate Biology, Comparative Vertebrate Morphology, Human Physiology, Mammalogy*
2018	Organizer, Graduate Research Brown Bag seminar series *Invited, advertised, and moderated semester long seminar series to highlight graduate student research*
2017-2018	Clemson Hope- Paw Pals *Helped elementary school students to improve writing skills*
2016-2018	Lead teaching assistant. Vertebrate Biology Laboratory. Clemson University *Organized 9-12 laboratory sections. Updated content to reflect new findings in the field and emphasize the connection between field observation and course content.*
2016-2018	Representative for Department of Biological Sciences to the College of Engineering and Sciences Student Advisory Board *PR committee and Outreach committee*
2014-2018	Guest lecture. Clemson University. Vertebrate Biology *Topics include Endothermy vs Ectothermy, Bird diversity, Dinosaurs & other Mesozoic diapsids, Mammal diversity*
2014-2016	Clemson University Natural History Museum. Laboratory and Website Development *Developed content and created interactive displays*
2011-2013	Mentor, Internet Science and Technology Fair *Worked with e-learning students on science fair projects*

Service & Outreach Activities

Reviewer for:	*Proceedings of the Royal Society B, Integrative Organismal Biology, Journal of Fish Biology, Ichthyology and Herpetology*
2021-Present	Assistant Editor for *Integrative and Comparative Biology*
2020-Present	Ask an animal scientist! (http://askananimalscientist.com/) *Created a website aimed at encouraging kids of all ages to ask questions about animals during the Covid-19 shutdown*
2019-Present	Skype a Scientist volunteer *Talk virtually with kids of all ages about biomechanics, ecology, and how science works! I have spoken with students at all age levels in CT, FL, GA, MA, NC, NY, UT, VA, WA, Canada, and the UK through this program!*

2019-Present	Outreach associate for the journal *Integrative Organismal Biology*. *Write blog posts to promote journal articles, including:* *Thick fish feed with superior suction* *Not all flashy snakes thrash dance the same!* *Egg-laying strategies of avian ancestors* *Antlion pits take advantage of ant slips* *Digital dissections finesse flight muscle measurements* *Big baby hypothesis supported by fossil fragments*
2018	Panelist, 'Writing a competitive travel grant,' SICB annual meeting, San Francisco, CA
2017	Tiger Talks *Encouraged elementary school students to pursue their interests in STEM*
2015-2016	Bring Your Daughter to Clemson Day *Developed interactive, hands-on displays for girls interested in STEM*
2014 - 2016	Clemson Relay for Life team member *Organized fundraisers for the American Cancer Society*
2013-2015	Graduate School Application Workshop, Clemson University *Collected and presented content to help undergraduates apply to graduate programs*

Affiliations

2019-Present	Sigma Xi
2017-Present	Society for the Study of Evolution
2015-Present	International Society of Vertebrate Morphology
2014-Present	American Society of Ichthyologists and Herpetologists
2013-Present	Society for Integrative and Comparative Biology *Divisions of Vertebrate Morphology, Comparative Biomechanics, and Ecology and Evolution*
2013- 2019	Clemson Biological Sciences Graduate Student Association *Member 2013-2019. Officer 2014-2015 & 2018*

Professional Development

2020-2021	Social Justice in Ecology Meetup group *Meet biweekly to discuss readings and best practices for making ecology more equitable*
2020	Virtual Morphometrics Meetup group *Met monthly to discuss cutting edge methods in quantifying morphology*
2020	Jackson Laboratories human and mammalian genetics and genomics: the 61st McKusick short course, virtual meeting
2019	Educating the vertebrate morphologists of the 21st century: technology, pedagogy, and core concepts symposia. International Congress of Vertebrate Morphologists. Prague, Czech Republic.

2016-2019 Clemson Writers Guild
Met weekly to improve scientific writing skills

2017 University of Washington Fish Biomechanics course, Friday Harbor, WA

2015 National Institute for Mathematical and Biological Synthesis Tutorial on Evolutionary Quantitative Genetics

2014 Teaching Colloquium Course. Clemson University
Course focused on pedagogy and teaching methods

2014 Big Island Water Resources Meeting. University of Hawaii. Hilo, HI

Invited Presentations

2021 Using microCT to quantify phenotype, Florida Atlantic University High School Lab Skills Workshop, Boca Raton, FL (virtual)

Ask a Scientist! King County Public Library, Seattle, WA (virtual)

Using AI to quantify phenotype. Florida Museum of Natural History, Gainesville, FL (virtual)

2020 Using machine learning and computational anatomy to quantify phenotype. Seattle Children's Research Institute, Seattle, WA (virtual)

Using Slicermorph in Biomechanics. St. Mary's College, Notra Dame, IN (virtual)

Using quantitative anatomy to define cranial phenotypes in mutant zebrafish. University of Washington, Seattle, WA (virtual)

Ask an animal scientist live! Bill & Melinda Gates Foundation. Seattle, WA (virtual)

2019 Migration performance: Gobies do more than just climb waterfalls. Wake Forest University, Salem, NC

Presentations

*Undergraduate Student, ‡ International Collaborator

2021 Computational anatomy and geometric shape analysis enables analysis of complex craniofacial phenotypes in zebrafish mutants. **KM Diamond**, RY Kwon, AM Maga. European Calcified Tissue Society meeting (virtual)

Machine learning-based segmentation and landmarking of 2D fish images. **KM Diamond**, BB Avants, AM Maga. Annual SICB meeting (virtual)

Geometric morphometrics of climbing kinematics in waterfall climbing goby fishes. JG Griner*, AM Palecek, **KM Diamond**, HL Schoenfuss, RW Blob. Annual SICB meeting (virtual)

Ontogenetic change in performance: do innovations constrain performance? HL Schoenfuss, **KM Diamond**, R Lagarde‡, T Maie, RW Blob. Annual SICB meeting (virtual)

2021 Measuring craniofacial variability in zebrafish using computational anatomy. **Diamond KM**, Kwon RY, Maga AM. Presented at SCRI research symposia (virtual December 2020) and annual SICB meeting (virtual)

2020 Linking morphology, performance, and behavior in the migration of stream goby fishes. **KM Diamond**, JG Griner*, R Lagarde‡, D Ponton‡, KE Powder, HL Schoenfuss, JA Walker, RW Blob. Annual SICB meeting. Austin, TX.

Comparative body shapes of amphidromous goby fishes living in different predator regimes. JF Griner*, **KM Diamond**, RW Blob. Annual SICB meeting. Austin, TX.

Do predators take advantage of prey blind spots? In-stream analysis of predator-prey interactions in Hawaiian stream fishes. NG Schneider*, AJ McKamy*, **KM Diamond**, RW Blob. Annual SICB meeting. Austin, TX.

Locomotor mechanics of juvenile alligators reveals ontogenetic changes in the roles of the fore- and hindlimbs. M Iijima‡, VD Munteanu, **KM Diamond**, RW Blob. Annual SICB meeting. Austin, TX.

Humeral strains during climbing in green iguanas: testing biomechanical release as a mechanism promoting morphological transitions in arboreal vertebrates. VD Munteanu, **KM Diamond**, CJ Mayerl, RW Blob. Annual SICB meeting. Austin, TX.

2019 Morphology, performance, & anti-predator strategies of gobiid fishes across predator regimes. **KM Diamond**, R Lagarde‡, D Ponton‡, K Powder, HL Schoenfuss, RW Blob. ICVM. Prague, Czech Republic.

Climbing and escape performance over migration pulses in the Hawaiian goby. **KM Diamond**, HL Schoenfuss, RW Blob. Annual SICB meeting. Tampa, FL

Bendy to the bone: a study of climbing goby vertebrae. GK Forker*, **KM Diamond**, RW Blob. Focus on Creative Inquiry. Clemson, SC

2018 Do predators take advantage of prey blind spots? AJ McKamy*, NG Schneider*, **KM Diamond**, RW Blob. SE SICB meeting, Clemson, SC.

Bendy to the bone. GK Forker*, **KM Diamond**, RW Blob. SE SICB meeting, Clemson, SC.

Take it or leave it. Fast-start modulation in the great sculpin *Myoxocephalus polyacanthocephalus*. LM Penrod, A Daddino, **KM Diamond**, JL Johansen, JF Steffensen‡, P Domenici‡. Annual SICB meeting. San Francisco, CA

Where to find the best bugs: a study of habitat use among lizard species with different movement strategies. EA Mcalpine-Bellis*, GE Garrison, S Gilbert Smith*, JRV Klein*, KL Utsumi*, **KM Diamond**, D Eifler, M Eifler. Annual SICB meeting. San Francisco, CA

Does the form of stress matter? A comparison of Pacific sand lance (*Ammodytes hexapterus*). A Daddino, **KM Diamond**, L Penrod, JL Johansen, JF Steffenson‡, P Domenici‡. Annual SICB meeting. San Francisco, CA

2018 Do the best come first? Locomotor performance over the course of migration events in the amphidromous goby fish, *Sicyopterus stimpsoni*. **KM Diamond**, HL Schoenfuss, RW Blob. Annual SICB meeting. San Francisco, CA

2017 Locomotor performance over the course of migration events in the amphidromous goby fish, *Sicyopterus stimpsoni*. **KM Diamond**, RW Blob. Southeastern SICB meeting. Blacksburg, VA

Comparative escape performance of prey fish species that face different degrees of range overlap with predators. **KM Diamond**, HL Schoenfuss, JA Walker, RW Blob. Clemson Biological Sciences Annual Student Symposium. Clemson, SC (3rd place oral presentation)

Does ontogenetic environment influence escape response? Comparative escape responses of goby fishes through ontogeny and among islands. **KM Diamond**, HL Schoenfuss, JA Walker, RW Blob. Annual SICB meeting. New Orleans, LA

Assessing the impacts of environmental contaminants on escape behavior in the migratory stream goby *Sicyopterus stimpsoni*. AM Rubin*, **KM Diamond**, HL Schoenfuss, RW Blob. Annual SICB meeting. New Orleans, LA & Clemson Biological Sciences Annual Student Symposium. Clemson, SC (2nd place in best poster)

Comparative waterfall climbing kinematics of goby fishes from Hawai'i and Réunion: are recently evolved behaviors less variable? RM Keeffe*, **KM Diamond**, R Lagarde‡, D Ponton‡, RS Bertram, HL Schoenfuss, RW Blob. Annual SICB meeting. New Orleans, LA

Mechanical specializations of the fin rays in waterfall-climbing gobiid fishes. NK Taft, BN Taft, **KM Diamond**, HL Schoenfuss, RW Blob. Annual SICB meeting. New Orleans, LA

2016 Does ontogenetic environment correlate with escape behavior in fish? **KM Diamond**, HL Schoenfuss, JA Walker, and RW Blob. Southeastern SICB meeting. Durham, NC

Is fish escape performance influenced by flow? Tests in the Hawaiian stream goby, Sicyopterus stimpsoni. **KM Diamond**, HL Schoenfuss, JA Walker, and RW Blob. Annual SICB meeting. Portland, OR

Waterfall-climbing performance of gobiid fishes from La Réunion: how conservative are novel functional behaviors? RS Bertram, HL Schoenfuss, R Lagarde‡, D Ponton‡, **KM Diamond**, T Offerle, and RW Blob. Annual SICB meeting. Portland, OR

Field observation of intraspecific and predatory attack behaviors of the Hawaiian sleeper fish, *Eleotris sandwicensis*. AM Rubin*, **KM Diamond**, HL Schoenfuss, and RW Blob. Presented at Annual SICB meeting. Portland, OR & Clemson Biological Sciences Annual Student Symposium. Clemson, SC

2015 Impacts of flow speed and attack direction on the fast-start escape response of the Hawaiian goby, *Sicyopterus stimpsoni*. **KM Diamond**, HL Schoenfuss, JA Walker, and RW Blob. Southeastern SICB meeting. Atlanta, GA.

Just keep swimming! Testing effects of flow speed and stimulus direction on escape behavior in a Hawaiian gobioid. **KM Diamond**. Clemson Biological Sciences Annual Student Symposium. Clemson, SC

2015 Fast-start escape behavior in juvenile Hawaiian gobies, *Sicyopterus stimpsoni*: testing effects of flow speed and stimulus direction. **KM Diamond**, HL Schoenfuss, JA Walker, and RW Blob. Presented at: Southeastern SICB meeting. Chapel Hill, NC (2014) and Annual SICB meeting. West Palm Beach, FL (2015)

2014 Sistematica y biogeografía de *Bothriechis schlegelii* (Berthold, 1846) (Serpentes: Viperidae), una approximacion molecular y morfológica. JP Hurtado Gómez‡, **KM Diamond**, CL Parkinson, and JM Daza Rojas‡. IV Congreso Colombiano de Zoologia. Cartagena de Indias, Colombia

Combined morphological and molecular analysis of rattlesnake phylogeny. AM Fenwick, **KM Diamond**, CL Parkinson. Southwestern Association of Naturalists Annual Meeting. Stillwater, OK

Evolutionary history and polymorphism of the eyelash palm pitviper (*Bothriechis schlegelii).* **KM Diamond**, JP Hurtado Gómez‡, JM Daza Rojas‡, CL Parkinson. Biology of the Pitvipers Symposium. Tulsa, OK

Individual variation in locomotor performance and field behavior in northern curly-tailed lizards (*Leiocephalus carinatus*): **KM Diamond**, ME Gifford, and R Powell. Annual SICB meeting. Austin, TX

2013 Evolutionary history and polymorphism in the Eyelash Palm Pit-viper (*Bothriechis Schlegelii*): **KM Diamond,** and CL Parkinson. Presented at: Southeastern Ecology and Evolution Conference and Showcase of Undergraduate Research. Orlando, FL

2012 Phylogeny of rattlesnakes (*Crotalus and Sistrurus*) based on morphological and molecular data: **KM Diamond**, AM Fenwick, CL Parkinson. Presented at: Southeastern Ecology and Evolution Conference. Clemson, SC and Showcase of Undergraduate Research. Orlando, FL

2011 Understanding evolutionary relationships of rattlesnakes (*Crotalus* and *Sistrurus*): **KM Diamond**, AM Fenwick, CL Parkinson. Showcase of Undergraduate Research. Orlando, FL

Combined morphological & molecular analysis of rattlesnake phylogeny: AM Fenwick, **KM Diamond**, CL Parkinson. Biology of the Rattlesnakes Symposium. Tucson, AZ