

Kelly M. Diamond

Postdoctoral Research Fellow
Seattle Children's Research Institute
Developmental Biology and Regenerative Medicine

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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

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>

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>

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>

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>

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.

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>

Diamond KM, Trovillion 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. *BioRxiv*
<https://doi.org/10.1101/2021.02.12.431035>

Elhamod M, **Diamond KM**, Maga AM, Bakis Y, Bart HL, Mabey P, Dahdul W, Leipzig J, Greenberg J, Avants B, Karpatne A. Hierarchy-guided neural networks for species classification. *Methods in Ecology and Evolution*. In review

Preprint available: <https://www.biorxiv.org/content/10.1101/2021.01.17.427006v1>

Rolfe S, Pieper S, Porto A, **Diamond KM**, Winchester J, Shan S, Kirveslahti H, Doug Boyer D, Summers A, Maga AM. 2020. SlicerMorph: An open and extensible platform to retrieve, visualize and analyze 3D morphology. *Methods in Ecology and Evolution*. In revision

Preprint available: <https://doi.org/10.1101/2020.11.09.374926>

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

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 review

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 revision

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 revision

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)

Clemson Professional Enrichment Grant (\$1000)

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

Service & Outreach Activities

Reviewer for:	<i>Proceedings of the Royal Society B, Integrative Organismal Biology, Journal of Fish Biology, Ichthyology and Herpetology</i>
2021-Present	Assistant Editor for <i>Integrative and Comparative Biology</i>
2020-Present	Ask an animal scientist! (http://askananimalscientist.com/) <i>Created a website aimed at encouraging kids of all ages to ask questions about animals during the Covid-19 shutdown</i>
2019-Present	Skype a Scientist volunteer <i>Skype with kids of all ages to talk 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!</i>

- 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-Present 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
Semester long course that focused on pedagogy and teaching methods
- 2014 Big Island Water Resources Meeting. University of Hawaii. Hilo, HI

Invited Presentations

- 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 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)
- 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 January 2021)
- 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.

- 2020 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
- 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

- 2017 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
- 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 Sistemática y biogeografía de *Bothriechis schlegelii* (Berthold, 1846) (Serpentes: Viperidae), una aproximación molecular y morfológica. JP Hurtado Gómez‡, **KM Diamond**, CL Parkinson, and JM Daza Rojas‡. IV Congreso Colombiano de Zoología. Cartagena de Indias, Colombia

- 2014 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