

Katherine [Kate] Elliott Bemis

National Systematics Lab, NOAA Fisheries

National Museum of Natural History, Smithsonian Institution

MRC 0153, 1001 Constitution Ave. N.W., Washington, DC 20560-0153

Work: 202-633-1270; Cell: 607-279-6474

bemisk@si.edu; katherine.bemis@noaa.gov

ORCID: 0000-0002-7471-9283

CURRENT POSITION

Research Zoologist, National Systematics Lab, NOAA Fisheries December 2019 – Present

Curator of Fishes, National Museum of Natural History, Smithsonian Institution

Affiliated Scholar, Virginia Institute of Marine Science

March 2024 – Present

EDUCATION

PhD Virginia Institute of Marine Science

August 2016 – December 2019

Department of Fisheries Science

Dissertation title: *Studies on the Anatomy of Teloestean Fishes*

Advisor: Eric J. Hilton

BS Cornell University, *Summa cum laude with distinction in research*

Class of 2015

Department of Natural Resources; minor in Marine Biology

Honors thesis title: *Deepwater dragonets (Teleostei: Callionymidae: Foetorepus) of the Mid Atlantic Bight: A little-known genus from the edge of the continental shelf*

Advisors: Irby J. Lovette and Patrick J. Sullivan

MANUSCRIPTS in PROGRESS

5. *Schumm, M. P., **K. E. Bemis**, D. K. Okamoto, and L. R. Parenti. Complex relationships of nitrogen isotope variation to diet in fishes of Chesapeake Bay over space and time. Formatted for Oecologia. *PhD student co-mentored by K. E. Bemis.
4. Ho, H.-C. and **K. E. Bemis**. Redefinition of *Stemonosudis intermedia* (Ege, 1933) and description of a new cryptic species from the Caribbean Sea (Aulopiformes: Paralepididae). Formatted for ZooKeys.
3. Schmitter-Soto, J. J., **K. E. Bemis**, T. E. Dowling, H. S. Espinosa-Pérez, L. T. Findley, C. R. Gilbert, K. E. Hartel, R. N. Lea, N. E. Mandrak, M. A. Neighbors, H. J. Walker, Jr. and L. M Page. How Many Fish Species Are in North America? Accepted at Ichthyology and Herpetology July 2024.
2. Bemis, W. E. and **K. E. Bemis**. Integrating tooth replacement patterns and odontogenesis in Bluefish, *Pomatomus saltatrix* (Acanthopterygii: Pomatomidae). In Revision at Ichthyology and Herpetology Nov 2023.
1. **Bemis, K. E.**, J. C. Tyler, E. J. Hilton and W. E. Bemis. Comparative Anatomy and Ontogeny

of Ocean Sunfishes (Tetraodontiformes: Molidae). In prep.

PUBLICATIONS

33. Collette, B. B. and **K. E. Bemis**. 2024. History of the monographic series *Fishes of the Western North Atlantic*. Ichthyology & Herpetology 112(3): 519–529. DOI: 10.1643/t2023102
32. Troyer, E., K. Evans, C. Goatley, M. Friedman, G. Carnevale, B. Nicholas, M. Kolmann, **K. E. Bemis** and D. Arcila. Evolutionary innovation accelerates morphological diversification in pufferfishes and their relatives. Evolution XX(XX): 1–14. DOI: 10.1093/evolut/qpae127
31. Fahimi, N., **K. E. Bemis** and J. A. Baeza. 2024. The mitochondrial genome of Yellowtail Snapper *Ocyurus chrysurus* (Block, 1791) (Perciformes: Lutjanidae). Journal of Natural History. DOI: doi.org/10.1080/00222933.2024.2388290
30. Kiser, H., K. Skufca, **K. E. Bemis** and J. A. Baeza. Comparative analysis of the mitochondrial genomes of Smoothhound sharks provide insight into the phylogenetic relationships within the family Triakidae. Gene Reports 36 (2024) 101957. DOI: doi.org/10.1016/j.genrep.2024.101957
29. Girard, M. G. M. D. Santos, **K. E. Bemis**. 2024. New species of redbait from the Philippines (Teleostei: Emmelichthyidae: *Emmelichthys*). ZooKeys 1196: 95–109. DOI: 10.3897/zookeys.1196.111161
28. Page, L. M., **K. E. Bemis**, T. E. Dowling, H. S. Espinosa-Pérez, L. T. Findley, C. R. Gilbert, K. E. Hartel, R. N. Lea, N. E. Mandrak, M. A. Neighbors, J. J. Schmitter-Soto, and H. J. Walker, Jr. 2023. AFS News: The Eighth Edition of Common and Scientific Names of Fishes. Fisheries: 1–2.
27. Cady, T, **K. E. Bemis**, and J. A. Baeza. 2023. The mitochondrial genome of the endangered Spiny Butterfly Ray *Gymnura altavela* (Linnaeus 1758) (Myliobatiformes: Gymnuridae) provides insights into cryptic lineages. Mitochondrial DNA Part A 1–9.
26. Page, L. M., **K. E. Bemis**, T. E. Dowling, H. S. Espinosa-Pérez, L. T. Findley, C. R. Gilbert, K. E. Hartel, R. N. Lea, N. E. Mandrak, M. A. Neighbors, J. J. Schmitter-Soto, and H. J. Walker, Jr. 2023. Common and Scientific Names of Fishes from the United States, Canada, and Mexico. Eighth Edition. American Fisheries Society Special Publication 37, 438 pages.
25. **Bemis, K. E.***, M. G. Girard*, M. D. Santos, K. E. Carpenter, J. R. Deeds, D. E. Pitassy, N. A. L. Flores, E. S. Hunter, A. C. Driskell, K. S. Macdonald III, L. A. Weigt, and J. T. Williams. 2023. Biodiversity of Philippine marine fishes: A DNA barcode reference library based on voucher specimens. Scientific Data 10:411. DOI: 10.1038/s41597-023-02306-9 *Contributed equally to the work.

24. **Bemis, K. E.**, J. C. Tyler, A. Kaneko, K. Matsuura, K. Murakumo, V. C. Espíndola, J.-L. Justine, D. Tyler, M. G. Girard, and W. E. Bemis. 2023. Pelvic-fan flaring and inflation in the Three-Tooth Puffer, *Triodon macropterus* (Tetraodontiformes: Triodontidae), with additional observations on their behavior in captivity. *Ichthyology & Herpetology* 111, No. 2, 2023, 222–240. DOI: 10.1643/i2022022. *Cover image*.
23. Galbraith, J. K., **K. E. Bemis**, W. E. Bemis, H. Cook and M. J. Wuenschel. 2022. Identifications, distributions, and life history of four species of *Seriola* (Carangiformes: Carangidae) in the western North Atlantic based on contemporary and historical data. NOAA Professional Paper NMFS 22:1–42. <https://doi.org/10.7755/PP.22>
22. Policarpo, M. *, **K. E Bemis***, P. Laurenti, M. Blin, L. Legendre, J.-C. Sandoz, S. Rétaux, and D. Casane. 2022. Coevolution of the olfactory organ and its receptor repertoire in ray-finned fishes. *BMC Biology*. *Contributed equally to the work.
21. Hoban, M. L., J. Whitney, A. G. Collins, C. Meyer, K. R. Murphy, A. J. Reft, and **K. E. Bemis**. 2022. Skimming for barcodes: rapid production of mitochondrial genome and nuclear ribosomal repeat reference markers through shallow shotgun sequencing. *PeerJ*: 10:e13790. DOI: 10.7717/peerj.13790
20. *Hegde, S., J. C. Tyler, W. Stearns and **K. E. Bemis**. 2021. Live coloration and schooling behavior of juvenile Sharptail Mola *Masturus lanceolatus* (Tetraodontiformes: Molidae) off south Florida, USA. *Southeastern Naturalist* 4(20): N102–N107. *High school student mentored by K. E. Bemis.
19. Hilton, E. J., A. M. Bauer, **K. E. Bemis**, M. H. Sabaj, D. G. Smith and G. J. Watkins-Colwell. 2021. A common love of science: the one-hundredth meeting of the American Society of Ichthyologists and Herpetologists. *Ichthyology & Herpetology* 109: 916–924. DOI: 10.1643/t2021071
18. Policarpo, M., **K. E Bemis**, J. C. Tyler, C. J. Metcalfe, P. Laurenti, J. C. Sandoz, S. Rétaux and D. Casane. 2021. Evolutionary dynamics of the OR gene repertoire in teleost fishes: Evidence of an association with changes in olfactory epithelium shape. *Molecular Biology and Evolution*. DOI:10.1093/molbev/msab145
17. Hays, G. C., J. D.R. Houghton, T. M. Thys, D. H. Adams, A. E. Ahuir-Baraja, J. Alvarez, M. Baptista, H. Batista, N. Baylina, **K. E. Bemis**, W. E. Bemis, E. J. Caldera, G. Carnevale, C. D. Carson, J. Pedro Correia, P. Reis Costa, O. Daly, J. Davenport, J. Dutton, L. E. Eagling, C. Figueiredo, K. Forsgren, M. Freese, S. García-Barcelona, C. Harrod, A. Hearn, L. Hellenbrecht, E. J. Hilton, M. J. Howard, R. L. Kelly, L. Kubicek, C. Lopes, T. Mowatt-Larsen, R. McBride, I. Nakamura, T. Nakatsubo, E. Nixon, M. Nyegaard, E. Ostalé-Valriberas, L. Pellegrino, N. D. Phillips, E. C. Pope, I. Potter, J. Raimundo, M. Riis, R. Rosa, J. P. Ryan, E. Sawai, G. Shinohara, D. W. Sims, L.L. Sousa, C. Taura, E. Tholke, K. Tsukamoto, J. C. Tyler, Y. Y. Watanabe, K. C. Weng, J. L. Whitney, Y. Yamanoue and K. S. Ydesen. 2020. Unresolved Questions About Ocean Sunfishes,

- Molidae: A Family Comprising Some of the World's Largest Teleosts. pp. 280-296. *In*: T. Thys, J. Houghton, and G. Hayes, *Evolution, Biology, and Conservation of the Ocean Sunfishes*, CRC Press. Boca Raton, FL, USA.
16. **Bemis, K. E.**, J. C. Tyler, E. J. Hilton and W. E. Bemis. 2020. Chapter 4 Overview of Comparative Anatomy and Ontogeny of Ocean Sunfishes. *In*: T. Thys, J. Houghton, and G. Hayes, *Evolution, Biology, and Conservation of the Ocean Sunfishes*, CRC Press. Boca Raton, FL, USA. pg. 55–71.
 15. **Bemis, K. E.**, J. C. Tyler, P. N. Psomadakis, L. N. Ferris, and A. B. Kumar. Review of the Indian Ocean spikefish genus *Mephisto* (Tetraodontiformes: Triacanthodidae). *Zootaxa* 4802 (1): 82–98.
 14. **Bemis, K. E.** and R. M. Keffe. 2019. Observation of Eastern Ratsnake (*Pantherophis alleghaniensis*) hunting Ruby-throated Hummingbirds (*Archilochus colubris*). *Herpetological Review* 50: 808–809.
 13. Kolmann, M., K. E. Cohen, **K. E. Bemis**, A. P. Summers, F. Irish, L. P. Hernandez. 2019. Tooth and consequences: heterodonty and dental replacement in piranhas and pacus (Serrasalminae). *Evolution & Development* 21: 278–293. DOI: 10.1111/jzo.12603
 12. **Bemis, K. E.**, J. C. Tyler, and D. Arcila. 2019. Life history, distribution and molecular phylogenetics of the Upward-Mouth Spikefish *Atrophacanthus japonicus* (Teleostei: Tetraodontiformes: Triacanthodidae). *Journal of Fish Biology* 94: 578–584. DOI: 10.1111/jfb.13923.
 11. Collette, B. B. and **K. E. Bemis**. 2019. Beloniformes. *In*: *Fishes of the Western North Atlantic, Part 10: Beloniformes*. Eds., B. B. Collette and T. J. Near. Yale University Press, pp. 1-4.
 10. Collette, B. B. and **K. E. Bemis**. 2019. Needlefishes, family Belonidae. *In*: *Fishes of the Western North Atlantic, Part 10: Beloniformes*. Eds., B. B. Collette and T. J. Near. Yale University Press, pp. 5-77.
 9. **Bemis, K. E.** and B. B. Collette. 2019. Sauries, family Scomberesocidae. *In*: *Fishes of the Western North Atlantic, Part 10: Beloniformes*. Eds., B. B. Collette and T. J. Near. Yale University Press, pp. 79-88.
 8. Collette, B. B. and **K. E. Bemis**. 2019. Halfbeaks, family Hemiramphidae. *In*: *Fishes of the Western North Atlantic, Part 10: Beloniformes*. Eds., B. B. Collette and T. J. Near. Yale University Press, pp. 89-147.
 7. Parin, N. V., I. B. Shakhovskoy, **K. E. Bemis**, and B. B. Collette. 2019. Flyingfishes, family Exocoetidae. *In*: *Fishes of the Western North Atlantic, Part 10: Beloniformes*. Eds., B. B. Collette and T. J. Near. Yale University Press, pp. 148-239.

6. **Bemis, K. E.**, S. M. Burke, C. A. St. John, E. J. Hilton, and W. E. Bemis. 2019. Tooth development and replacement in the Atlantic Cutlassfish, *Trichiurus lepturus*, with comparisons to other Scombroidei. *Journal of Morphology* 280:78–94. DOI: 10.1002/jmor.20919. *Cover image*.
5. McGuire, B., B. Olsen, **K. E. Bemis**, and D. Orantes. 2018. Urine marking in male domestic dogs: Honest or dishonest? *Journal of Zoology* 306: 163–170. DOI: 10.1111/jzo.12603
4. **Bemis, K. E.**, B. Marcy-Quay, J. K. Galbraith, M. J. Wuenschel, P. J. Sullivan, and W. E. Bemis. 2018. Deep-water dragonets (Teleostei: Callionymidae: *Foetorepus*) of the Mid Atlantic Bight: A little-known genus from the edge of the continental shelf. *Copeia* 106:188–198. DOI: 10.1643/CI-17-662.
3. **Bemis, K. E.**, J. C. Tyler, W. E. Bemis, K. Kishor, R. S. Rana, and T. Smith. 2017. A gymnodont fish jaw with remarkable molariform teeth from the early Eocene of Gujarat, India (Teleostei, Tetraodontiformes). *Journal of Vertebrate Paleontology* 37: 10 pages, DOI: 10.1080/02724634.2017.1369422.
2. McGuire, B. and **K. E. Bemis**. 2017. Scent marking in shelter dogs: Effects of body size. *Applied Animal Behaviour Science* 186: 49–55. DOI: 10.1016/j.applanim.2016.11.001.
1. **Bemis, K. E.** and W. E. Bemis. 2015. Functional and developmental morphology of tooth replacement in the Atlantic Wolffish, *Anarhichas lupus* (Teleostei: Zoarcoidei: Anarhichadidae). *Copeia* 103(4): 886–901. DOI: 10.1643/OT-14-141. *Best Student Paper, Ichthyology in 2015 volume of Copeia; shared cover image*.

INVITED BOOK REVIEWS

- Bemis, K. E.** 2021. Book Review of *Frogfishes: Biodiversity, Zoogeography, and Behavioral Ecology* by Theodore W. Pietsch and Rachel J. Arnold. *Ichthyology & Herpetology*, 109:925–927. DOI: 10.1643/t2021054
- Bemis, K.** and E. J. Hilton. 2020. A bridge between worlds: *Tunas and Billfishes of the World*. Invited book review. *Environmental Biology of Fishes* 3: 209–211.

OTHER PUBLICATIONS

- Baldwin, C. C. and **Bemis, K. E.**, editors. 2022. *Tributes to Victor G. Springer in celebration of his 94th birthday*. Washington, DC: Division of Fishes, Smithsonian National Museum of Natural History. DOI: 10.5479/10088/114290
- Bemis, K. E.** 2019. Atlantic Wolffish: A Tale of Missing Teeth. Subjects: Life Science, Biology, Marine/Ocean Science - Grades: 6-8. VA SEA 2019 Lesson Plans. Virginia Institute of Marine Science, College of William and Mary. DOI: 10.25773/bfcp-vc73.

GRANTS

- Interagency Agreement between FDA and NMNH: Inventory and DNA Barcoding Marine Fishes for Food Safety and Biodiversity (Co-PIs **K. E. Bemis**, D. Pitassy, J. Deeds, L.

Weigt; 2021–2024 \$141,000)

Smithsonian Institution Barcoding Network (PI M. G. Girard, Co-PIs **K. E. Bemis** and C. C. Baldwin; 2022; \$8,687. *Generating complete mitogenomes and ribosomal repeat regions of two poorly studied families of fishes using ethanol- and formalin-fixed tissues*

Smithsonian Institution Barcoding Network (PI **K. E. Bemis**, Co-PIs A. G. Collins, C. Meyer, J. Whitney, M. Hoban, A. Reft, D. Leopold, and J. Craine, 2022; \$25,000). *Phase 2 of Deriving complete mitogenomes and ribosomal repeat regions using a genome skimming approach: Contractor to develop pipeline to automatically assemble, annotate, and upload sequence data to GenBank*

Smithsonian Institution Barcoding Network (PI **K. E. Bemis**, Co-PI A. Collins, 2021; \$25,000). *Deriving complete mitogenomes and ribosomal repeat regions for fishes using a genome skimming approach.*

Collections Care and Preservation Fund (Prepared by Steve Gotte, Esther Langan, Lisa Palmer, Lynne Parenti, Diane Pitassy, Addison Wynn, and **Katherine E. Bemis**; \$298,587). *Glass microscope slides in the Department of Vertebrate Zoology: Preservation and registrarial control.*

Key Personnel for Office of Naval Research funded project: *Energy Self Sufficient & Damage Resilient Elongate Fish Inspired Robot via Embodied Energy and Wave Energy Harvesting*. PI Robert Shepherd, Cornell University. March 2022 – March 2026; project budget: \$7,200,000

Interagency Agreement between NOAA Office of Science and Technology and National Museum of Natural History (Co-organized with Allen Collins, 2021–2023; \$116,00)

NSF-DEB Exploring the genomics of convergent snout elongations in deep-sea fishes (Co-PI w/ D. Arcila; 2020; \$300,062)

The Company of Biologists Scientific Meeting Grant (w/ K. E. Cohen; 2019; \$6,344) and Gans Foundation (w/ K. E. Cohen 2019; \$3,000), received to host *Merging Histology and Biomechanics Workshop* in August 2019

VIMS Equipment Trust Fund for two 35-gallon specimen tanks (2019; \$1,970)

VIMS Office of Academic Studies Travel Grant to attend ASIH (2019; \$600)

Friday Harbor Laboratory Stephen and Ruth Wainwright Endowed Fellowship (2019; \$600)

NSF Graduate Research Internship Program Supplement Award (w/ J. C. Tyler; 2018; \$5,000)

American Museum of Natural History Lerner-Gray Fund for Marine Research (2017; \$2,500)

American Society of Ichthyologists and Herpetologists Raney Award (2017; \$500)

John E. Olney Sr. Ichthyology Award (2017; \$2,991)

VIMS Equipment Trust Fund for CT-reconstruction computer (w/ D. Vaz, K. Parsons; 2016; \$3,000)

Cornell Morley Student Research Grant (2014; \$500)

Jane E. Brody Undergraduate Research Grant (2014; \$500)
Cornell Alumni Association Research Grant (2013; \$900)
Cornell Morley Student Research Grant (2013; \$500)

FELLOWSHIPS and SCHOLARSHIPS

Clyde D. & Lois W. Marlatt, Jr., VIMS Foundation (2018; \$3,500)
William J. Hargis, Jr. Fellowship, VIMS Foundation (2017; \$2,000)
Kathleen & Robert Roper, Jr. Fellowship, VIMS Foundation (2017; \$1,000)
Nancy S. and Henry George Fellowship, VIMS Foundation (2016–2017; \$4,000)
Rawlings Cornell Presidential Research Scholar (2013–2015; \$5,000)
NSF Graduate Research Fellowship (2015–2018; ~\$150,000)
NOAA Ernest F. Hollings Undergraduate Scholarship (2013–2015; \$22,500 + travel)

RECOGNITIONS and AWARDS

New species of a fossil pufferfish from the Pshekha River, North Caucasus, Russia named for me, †*Archaeotetraodon bemisae* Bannikov and Tyler, 2024
National Museum of Natural History, Smithsonian Institution 2019 Science Achievement Award for Bruce B. Collette, Katherine E. Bemis, Nicolay V. Parin, and Ilia B. Shakhovskoy, eds. 2019. *Fishes of the Western North Atlantic, Part 10: Order Beloniformes: Needlefishes, Sauries, Halfbeaks, and Flyingfishes*.
New species of flyingfish named for me, *Cheilopogon katherinae* Shakhovskoy and Parin, 2019
Katherine's Red Sea Flyingfish, красноморский длиннокрыл Катерины
William and Mary Graduate Research Symposium Honorable Mention for Excellence in Natural and Computational Sciences (2017; \$250)
Best Student Paper, Ichthyology in the 2015 volume of *Copeia* (2016)
CALS Academic Excellence in the Natural Resources Major (highest GPA in major; 2015)
Cornell University Dean's List (8 semesters, 2011–2015)
John M. Anderson Award for Excellence in Natural History (2014; \$1,000)

SELECTED PRESENTATIONS

* indicates student mentored by K. E. Bemis

MacLeod, L. *, M. G. Girard, and **K. E. Bemis**. The deep-water Freckled Stargazer *Xenocephalus egregius* (Uranoscopidae). Poster. Joint Meeting of Ichthyologists and Herpetologists Society of Ichthyologists and Herpetologists July 2024.

MacLeod, L. *, **K. E. Bemis**, S. Farina. Morphological Diversity of the Oral Lures of Stargazers (Uranoscopidae). Oral presentation. Joint Meeting of Ichthyologists and Herpetologists Society of Ichthyologists and Herpetologists July 2024.

Rose, N. S. *, M. A. Fortaleza, J. P. Cabasan, K. L. Labrador, J. J. Lanutan, C. L. Nañola, M. G. Girard, and **K. E. Bemis**. A new species of flathead (Platycephalidae: *Elates*), with notes on the biology of the genus. Poster. Joint Meeting of Ichthyologists and Herpetologists Society of Ichthyologists and Herpetologists July 2024.

- Tang, C.-N.*, W.-J. Chen, **K. E. Bemis**. The infraorbital morphology of *Plectranthias* species (Perciformes: Anthiadidae). Poster. Joint Meeting of Ichthyologists and Herpetologists Society of Ichthyologists and Herpetologists July 2024.
- Bemis, K. E.** Taxonomic studies and training aboard the R/V *Dr. Fridtjof Nansen* IMR-NOAA Annual Fisheries Science Bilateral Meeting. 30 May 2024.
- Bemis, K. E.** Biodiversity and Fisheries Surveys. Virginia Institute of Marine Science. 30 April 2024. Ichthyology. Invited speaker.
- Bemis, K. E.** Sustainable marine fisheries for Northwest Africa: Collections, taxonomy, and training. 19 April 2024. NMNH VZ Coffee. Invited speaker.
- Bemis, K. E.** 27 March 2024. Fish taxonomy: Results from Senegal and Gambia transboundary demersal survey. Onboard R/V *Dr. Fridtjof Nansen*.
- Bemis, K. E.** 15 March 2024. Fish taxonomy: Results from Mauritania transboundary demersal survey. Onboard R/V *Dr. Fridtjof Nansen*.
- Bemis, K. E.** Intersections of fisheries and taxonomy. 6 March 2024. Onboard R/V *Dr. Fridtjof Nansen*.
- Bemis, K. E.**, D. E. Pitassy, M. G. Girard, K. R. Murphy, A. J. Reft, L. A. Weigt. 23 January 2024. DNA reference libraries of marine fishes: Ichthyoplankton, fisheries, biodiversity studies, and food safety. Nha Trang University, Vietnam. Invited speaker.
- Bemis, K. E.**, M. G. Girard, M. D. Santos, K. E. Carpenter, J. R. Deeds, D. E. Pitassy, N. A. L. Flores, E. S. Hunter, A. C. Driskell, K. S. Macdonald III, L. A. Weigt, N. S. Rose*, and J. T. Williams. Biodiversity of Philippine Fishes: A DNA barcode reference library based on voucher specimens highlights remaining taxonomic questions in the region. Joint Meeting of Ichthyologists and Herpetologists Society of Ichthyologists and Herpetologists July 2023.
- Bemis, K. E.** and J. C. Tyler. ROV observations of the rare spikefish, *Hollardia cf goslinei* (Triacanthodidae). Joint Meeting of Ichthyologists and Herpetologists Society of Ichthyologists and Herpetologists July 2023.
- Montalvo, M., M.* L. Habegger, K. Cisz, **K. E. Bemis**, and E. J. Hilton. Morphology, ontogeny, and replacement of teeth on the bills and lower jaws of billfishes (Istiophoriformes). Joint Meeting of Ichthyologists and Herpetologists Society of Ichthyologists and Herpetologists July 2023.
- Ng, S.-L. *, **K. E. Bemis**, K.-M. Liu, and S.-J. Joung. Re-examination on two closely related *Etmopterus* species, *E. decacuspidatus* Chan, 1966 and *E. evansi* Last, Burgess & Séret, 2002: Is the cusplet numbers stable to separate lanternshark species? Joint Meeting of

Ichthyologists and Herpetologists Society of Ichthyologists and Herpetologists July 2023.
*Student presenter mentored by KEB.

Bemis, W. E., G. V. F. Afonso*, E. J. Hilton, R. Shepherd, and **K. E. Bemis**. Trunk Morphology and Swimming Modes of the Giant Oarfish, *Regalecus glesne* (Lampriformes: Regalecidae). Joint Meeting of Ichthyologists and Herpetologists Society of Ichthyologists and Herpetologists July 2023.

Schumm, M.*, **K. E. Bemis**, L. Parenti, and D. Okamoto. Evaluating long-term shifts in diet in harvested Chesapeake Bay fishes. Joint Meeting of Ichthyologists and Herpetologists. July 2023

Afonso, G., F.* Bockmann, and **K. E. Bemis**. Heterodonty through ontogeny – Tooth development and replacement in the scale feeding fish *Oligoplites saurus* Bloch & Schneider 1801. Joint Meeting of Ichthyologists and Herpetologists. July 2022, Spokane, WA.

MacLeod, L.*, **K. E. Bemis**, and C., M. Pastana. First description of the osteology of the West African Stargazer, *Uranoscopus cadenati*. Joint Meeting of Ichthyologists and Herpetologists. July 2022, Spokane, WA.

Schmitt, C.*, M. Pastana, and **K. E. Bemis**. Vertical Orientation and Schooling: Behavioral Description of the Cutlassfish, *Trichiurus lepturus*. Joint Meeting of Ichthyologists and Herpetologists. July 2022, Spokane, WA.

Bemis, K. E., J. C. Tyler, A. Kaneko, K. Matsuura, K. Murakumo, J.-L. Justine, D. M. Tyler, W. E. Bemis. Pelvic-fan Flaring and Inflation in the Three-Tooth Puffer, *Triodon macropterus* (Tetraodontiformes: Triodontidae). Joint Meeting of Ichthyologists and Herpetologists. July 2022, Spokane, WA.

Bemis, K. E. Invited speaker for Potomac Valley Aquarium Society. 5 February 2022. Pelvic-fan flaring and inflation in Three-Tooth Puffer, *Triodon macropterus*.

Bemis, K. E. Invited lecture for University of Rhode Island Ichthyology class. 2 February 2022. Fisheries Survey and Ocean Sunfish Strandings.

Bemis, K. E. Invited talk for Salisbury University Department of Biological Sciences. 4 November 2021. Biology of Ocean Sunfishes (Molidae): Insights into Morphology and Natural History.

Bemis, K. E. Invited lecture for California State University, Chico Fish Biology class. 19 November 2021. Biology of Ocean Sunfishes (Molidae): Insights into Morphology and Natural History.

Bemis, K. E. VZ Coffee, NMNH. 4 February 2022. Field 2021: Fisheries Survey and Ocean Sunfish Strandings.

- Bemis, K. E.,** J. C. Tyler, E. J. Hilton and W. E. Bemis. Anatomy of Ocean Sunfishes, Ocean Sunfish Symposium, 23 February 2021. Streamed live and recorded here:
<https://www.youtube.com/watch?v=woRoItccGIY&t=5s>
- Bemis, K. E.,** A. Collins, M. Hoban, C. Meyer, K. Murphy, A. Reft, and J. Whitney. Fish Mitogenomes. IZ weekly lunch seminar No Bones, 30 April 2021. Co-presented with Allen Collins.
- Bemis, K. E.,** J. C. Tyler, A. Kaneko, K. Matsuura, and K. Murakumo. Inflation in Three-Tooth Puffer, VZ Monthly Coffee, National Museum of Natural History, 16 October 2020.
- Bemis, K. E.,** J. C. Tyler, E. L. Stanley, and E. J. Hilton. Dentition of living and fossil Diodontidae (Porcupinefishes): Implications for taxonomy of isolated jaws in the fossil record. Joint Meeting of Ichthyologists and Herpetologists. July 2019, Snowbird, UT. Invited contribution to The Expanding Role of Natural History Collections Symposium.
- Bemis, K. E.,** J. C. Tyler, and D. Arcila. Life history, distribution and molecular phylogenetics of the Upward-Mouth Spikefish *Atrophacanthus japonicus* (Teleostei: Tetraodontiformes: Triacanthodidae). Joint Meeting of Ichthyologists and Herpetologists. July 2019, Snowbird, UT.
- Bemis, K. E.,** J. C. Tyler, E. J. Hilton and *W. E. Bemis. Comparative anatomy of and ontogeny of Ocean Sunfishes (Tetraodontiformes: Tetraodontoidea: Molidae). Joint Meeting of Ichthyologists and Herpetologists. July 2019, Snowbird, UT. *Poster presented by WEB.
- Bemis, K. E.,** J.C. Tyler, and E. J. Hilton. Dentition of living and fossil Diodontidae (Porcupinefishes): Implications for taxonomy of isolated jaws in the fossil record. William and Mary Graduate Research Symposium. March 2019, Williamsburg, VA.
- Bemis, K. E.** Anatomy and phylogeny of tooth replacement in actinopterygian fishes. Wake Forest University Eco-Evo Lunch, Winston-Salem, NC. March 2019. Invited talk.
- Bemis, K. E.** and E. J. Hilton. Tooth development, attachment and replacement in the Longnose Lancetfish, *Alepisaurus ferox*. Society of Integrative and Comparative Biologists. January 2019, Tampa, FL.
- Bemis, K. E.** and E. J. Hilton. Tooth development, attachment and replacement in the Longnose Lancetfish, *Alepisaurus ferox*. Joint Meeting of Ichthyologists and Herpetologists. July 2018, Rochester, NY.
- Bemis, K. E.** The Golden Puffer, *Chonerhinos naritus* (Richardson, 1848) (Teleostei: Tetraodontiformes), an anadromous, piscivorous pufferfish, from Southeast Asia. Joint Meeting of Ichthyologists and Herpetologists. July 2018, Rochester, NY.
- Bemis, K. E.** Using fossils to inform our understanding of living species. Writing in the Majors section of Evolution and Diversity, Cornell University. November 2017, Ithaca, NY Oral.

- Bemis, K. E., J. C. Tyler, W. E. Bemis, and E. J. Hilton.** Ontogeny of Tooth Replacement of Molidae (Ocean Sunfishes) and Diodontidae (Porcupinefishes). Indo Pacific Fish Conference. October 2017, Tahiti, French Polynesia.
- Bemis, K. E., J. C. Tyler, W. E. Bemis, and E. J. Hilton.** Comparative anatomy of the dentition of Molidae (Ocean Sunfishes) and Diodontidae (Porcupinefishes): New insights from ontogeny and patterns of tooth replacement. Joint Meeting of Ichthyologists and Herpetologists. July 2017, Austin, TX.
- Bemis, K. E., J. C. Tyler, W. E. Bemis, K. Kishor, R. Rana, and T. Smith.** A gymnodont fish jaw with remarkable molariform teeth from the early Eocene of Gujarat, India (Teleostei, Tetraodontiformes). Joint Meeting of Ichthyologists and Herpetologists. July 2017, Austin, TX.
- Bemis, K. E., J. C. Tyler, W. E. Bemis, and E. J. Hilton.** Comparative anatomy of the dentition of Ocean Sunfishes (Molidae) and Porcupinefishes (Diodontidae). William and Mary Graduate Research Symposium. March 2017, Williamsburg, VA.
- Bemis, K. E., S. M. Burke, C. St. John, T. Hughes, and W. E. Bemis.** Tooth development, attachment and replacement in the Atlantic Cutlassfish, *Trichiurus lepturus*. Joint Meeting of Ichthyologists and Herpetologists. July 2016, New Orleans, LA.
- Bemis, K. E., B. Marcy-Quay, I. Lovette, P. Sullivan, and W. E. Bemis.** Deepwater dragonets (Teleostei: Callionymidae: *Foetorepus*) of the Mid Atlantic Bight: A little-known genus from the edge of the continental shelf. Joint Meeting of Ichthyologists and Herpetologists. July 2015, Reno, NV.
- Bemis, K. E.** Deepwater dragonets (Teleostei: Callionymidae: *Foetorepus*) of the Mid Atlantic Bight: A little-known genus from the edge of the continental shelf. Honors Thesis Defense, Department of Ecology and Evolutionary Biology, Cornell University. May 2015, Ithaca, NY.
- Bemis, K. E. and B. B. Collette.** Beloniformes of the Western North Atlantic. NOAA Hollings Symposium. July 2014, Silver Spring, MD.
- Bemis, K. E. and W. E. Bemis.** Tooth development, attachment and replacement in the Atlantic Wolffish, *Anarhichas lupus*. Joint Meeting of Ichthyologists and Herpetologists, Special Symposium: Fishes and Morphology Today. July 2013, Albuquerque, NM.

LAB MEMBERS

Cristhian Conde, Collette Postdoctoral Fellow, co-advised by Lynne Parenti	2024 – Present
Victor (Chi Ngai) Tang, National Taiwan University, co-advised by Carole Baldwin	2024
Terry (Shing-Lai) Ng, Taiwan Ocean Institute,	2022 – 2023
Ned Rose, Virginia Tech,	2026
Matthew Schumm, Florida State University, 2025, co-advised by Lynne Parenti	2021 – Present

Gabriel Afonso, University of Sao Paulo, 2023	2021 – Present
Leo MacLeod, University of Washington 2022, Howard University 2026	2021 – Present
Cole Schmitt, California State University, Chico 2022	2021 – 2023
Sabrina Shih, Cornell University 2021	2020 – 2021
Cory Farrelly, UMass Dartmouth 2020	2021
Shanthi Hegde, Lambert High School 2021	2020 – 2021
Jack Corso, Princeton University 2019	2020 – 2021
Khalil Russell, William & Mary 2021	2019 – 2020
Samantha M. Burke, Cornell University 2019	2016 –2019

GRADUATE STUDENT COMMITTEES

Gabriel Afonso, Virginia Institute of Marine Science	2024 – Present
Leo MacLeod, Howard University	2024 – Present
Kaite Cisz, Virginia Institute of Marine Science	2023 – Present
Matthew Duggan, Cornell University	2023 – Present
Zach Hieple, Scripps Institution of Oceanography	2022 – Present
Miguel Montalvo, Virginia Institute of Marine Science	2022 – Present

External Examiner for dissertation of Rose Peterson, George Washington University;
Evolutionary relationships for Osteoglossiformes (knife fishes and weakly electric mormyrids)
and convergent trait evolution May 2022

TEACHING EXPERIENCE

Undergraduate teaching assistant for on-campus course at Cornell University:

Vertebrates: Structure, Function and Evolution (BioEE 2740) Spring 2013 & 2014

Teaching assistant for field courses at Shoals Marine Laboratory (SML):

Sustainable Marine Fisheries (BioSM 2800) Summer 2015 & 2016

Evolution and Marine Diversity (BioSM 1780) Summer 2012 & 2013

Whales, Seals and Sharks (BioSM 1650) Summer 2011

WORKSHOP ORGANIZATION

Co-organized Undergraduate Virtual Fishes Conference (UVFC) with Khalil Russell, Sabrina Shih, and Leo MacLeod in August 2020 and August 2021 to provide an opportunity for undergraduates to present research and network with other students and professionals. 50 attendees from universities, museums, state and federal agencies.

Co-organized *Merging Histology and Biomechanics Workshop* with K. E. Cohen, Friday Harbor Laboratory, August 2019. Provided cost of travel, housing, and materials for eight graduate students and postdocs to learn paraffin and plastic histology and SEM methods during 5-day workshop. Participants processed their own samples, and all left with data.

PROFESSIONAL SOCIETIES and SERVICE

Fisheries Bulletin Editorial Board 2022 – Present

American Society of Ichthyologists and Herpetologists (member 2013, life membership 2016)

Elected to Gibbs Committee, 2022 – 2025
 Elected to Spiritus Committee, 2021 – 2024
 Elected to Nominating Committee, 2021
 Elected to Board of Governors, Class of 2020 – 2024
 AFS-ASIH Joint Committee on Scientific and Common Names of Fishes, 2018 – Present
 Ichthyology & Herpetology Editorial Board, 2020 – Present
 Student Co-chair of Ichthyology and Herpetology Collections Committee, 2018 – 2019
 Copeia Editorial Board, student member, 2018 – 2020
 History of the Society Committee, 2018 – Present

American Fisheries Society, member 2018 – Present

SERVICE to NATIONAL MUSEUM OF NATURAL HISTORY

Genomics Advisory Committee, June 2023 – Present
 OceanDNA Initiative, June 2023 – Present
 VZ Fellowships Committee, 2020–2024 review process
 Collections Committee, VZ representative, April 2021– Present
 eDNA Working Group, Infrastructure (Data Management) Subgroup, January 2021 – March 2022
 Onboarding Committee, affiliated agency representative, February 2021 – March 2022

SERVICE to VIMS and CORNELL UNIVERSITY

VIMS Ombudsperson	2018 – 2020
Peer mentor and confidential resource for graduate students to promote conflict resolution for problems that arise in the university setting.	
Curatorial Search for Cornell University Museum of Vertebrates	2015
Rawlings Peer Advisor Cornell University	2014 – 2015
Environmental Science and Sustainability Curriculum Committee at Cornell	2014 – 2015

SELECTED OUTREACH

Contributed to: Voyage of the Totoaba June 2024
<https://www.fisheries.noaa.gov/feature-story/voyage-totoaba-30-year-journey-lasting-scientific-legacy>

Contributed to: NOAA Fisheries Zoologist Describes New Fish Species March 2024
https://www.fisheries.noaa.gov/feature-story/noaa-fisheries-zoologist-describes-new-fish-species?utm_medium=email&utm_source=govdelivery

Wrote: 60 Species of Fish to Celebrate 60 Years of the Bottom Trawl Survey November 2023
<https://www.fisheries.noaa.gov/science-blog/60-species-fish-celebrate-60-years-bottom-trawl-survey>

Supported NMNH Education team by provided tour of Fish Collections for Smithsonian Education Summit. Participants included 25 middle and high school teachers, 18 June 2024.

Wrote Pufferfishes and their relatives for Ocean Portal illustrated by Danielle Hall;
<https://ocean.si.edu/ocean-life/fish/pufferfishes-and-their-relatives>

Smithsonian After Hours World Ocean Day Sip & Create with Dwight Hwang June 2023
STEAM for adults project funded by Smithsonian Institution Asian Pacific American Center

Swordfish dissection for Career Shadowing Day for Biodiversity Career Event 20-21 April 2023
<https://www.biodiversityliteracy.com/speakers23>

Albert Einstein Distinguished Educator Fellows professional development event June 2022
Focused on fish diversity, observation, and natural history collections

Virginia Institute of Marine Science Policy Class at NMNH Ocean Hall March 2022, 2023
to discuss importance of systematics research in policy decisions

Scientific Illustration as part of Summer Explorations July 2020
Deep Sea Adaptations Smithsonian Distance Learning, Live Zoom webinar with Rachel
Keeffe and Lara Noren, recorded [here](#)

The Experts are Online, Smithsonian Distance Learning May 2020
Live Zoom webinar with D. Pitassy on Spikefish Adaptations, recorded [here](#)

Virginia Science Educators Alliance (VASEA) 2018–2019
Developed a lesson plan based on Bemis and Bemis (2015) that engages middle school
students to study the teeth of museum specimens of Atlantic Wolffish and interpret in
context of ecology. Classroom tested and publicly available [here](#); DOI: 10.25773/bfcp-vc73

NATURAL HISTORY COLLECTIONS EXPERIENCE

Museum experience: Visited and worked in collections including Cornell University Museum of
Vertebrates, Smithsonian Institution; VIMS Nunnally Ichthyological Collection; Harvard
Museum of Comparative Zoology; Academy of Natural Sciences; American Museum of
Natural History; University of Florida; North Carolina Museum of Natural Science;
National Museum of Nature and Science, Japan; Australian Museum, Australia; Queensland
Museum, Australia; Natural History Museum, England.

Collection building: Deposited skeletal and fluid specimens in permanent collections at
Smithsonian National Museum of Natural History, Virginia Institute of Marine Science
Nunnally Ichthyological Collection and Cornell University Museum of Vertebrates.

Specimen preparation: Vertebrate dissection, tissue preparations and DNA extractions, dry
skeletal preparation, clearing and staining for cartilage and bone, histological methods
including paraffin and plastic embedding, SEM.

Imaging and illustration: Field and laboratory photography (micro and macro methods), digital
flat x-ray, CT scanning and reconstruction to study material nondestructively. Experience
with three CT scanners to collect 1-1000 µm voxel datasets, including training to operate

Nano-CT GE V|Tome|X M 240. Experienced user of Adobe Photoshop and Illustrator software for figure preparation.

SEATIME and FIELD COLLECTING

2024: Fall Bottom Trawl survey on NOAA Ship *Henry B. Bigelow*

Leg I: 4 September – 25 September, Newport – Cape Hatteras; Chief scientist J. Galbraith

2024: Sailed as reference fish taxonomist on an [EAF-Nansen Programme](#) cruise to assess transboundary demersal resources in the eastern Atlantic and collect voucher specimens. Mauritania, Senegal, The Gambia, 28 February – 28 March.

2024: Nha Trang, Vietnam. Co-led team of six NOAA and NMNH scientists on FDA funded collecting trip to Vietnam to sample fish market specimens and develop genetic reference library for Vietnam. 20 January – 5 February 2024

2023: Fall Bottom Trawl survey on NOAA Ship *Henry B. Bigelow*

Leg I: 6 September – 29 September, Newport – Cape Hatteras; Chief scientist J. Galbraith

2023: Japan, Okinawa Churaumi Aquarium

9-20 February 2023. Studied live *Triodon macropterus* and collected fishes from the East China Sea.

2022: Curacao, NMNH Deep Reef Observation Program (DROP)

9-18 December 2022. Three submersible dives; photographed rare specimens of callionymids and other deep reef fishes

2022: Fall Bottom Trawl survey on NOAA Ship *Henry B. Bigelow*

Leg I: 11 September – 26 September, Newport – Cape Hatteras; Chief scientist J. Galbraith

2021: Fall Bottom Trawl survey on NOAA Ship *Henry B. Bigelow*

Leg I: 11 September – 30 September, Newport – Cape Hatteras; Chief scientist J. Galbraith

2019, 2021, 2022, 2024: VIMS Roanoke Roundup, four days of sampling streams in western Virginia drainages

2018: Fall NEAMAP Groundfish Survey on F/V *Darana R*

Last Leg: 6 – 12 November, Hampton – Cape Hatteras; Chief Scientist J. Gregg

2016: Summer Groundfish Survey on NOAA Ship *Oregon II*

Leg III: 11 – 20 July, Pascagoula – Western Florida; Field Party Chief K. Johnson

- 2015: Fall Bottom Trawl survey on NOAA Ship *Henry B. Bigelow*
Leg I: 31 August – 17 September: Cape May – Cape Hatteras; Chief scientist J. Galbraith
Leg II: 21 September – 3 October: Mid-Atlantic – S New England; Chief scientist P. Politis
- 2014: Spring Bottom Trawl survey on NOAA Ship *Henry B. Bigelow*
Leg I: 4 March – 21 March: Cape May – Cape Hatteras; Chief scientist J. Galbraith
- 2013: Fall Bottom Trawl survey on NOAA Ship *Henry B. Bigelow*
Leg I: 3–19 September: Cape May – Cape Hatteras; Chief scientist J. Galbraith
Leg II: 23 September – 4 October: Mid-Atlantic – S New England; Chief scientist P. Chase
- 2011 – 2016: 25+ day trips on small research and fishing vessels (10-50 ft) in Gulf of Maine including research vessels and commercial lobstering, trawling, gillnetting, and recreational head boats.