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Education and Academic Positions:

08-2020 – Present	Assistant Professor
08/2017 – 08/2020	Post-Doctoral Research Associate; UIUC: Dept. of Evolution, Ecology and Behavior
09/2015 – 07/2017	Post-Doctoral Research Associate; NJIT: Fed. Dept. Biology

PhD (Biology)

University of Washington, Seattle (2009- 2015)

BA (Biology)

University of Chicago (2002-2006)

Publications (*papers that include student led research):

1. Dobkowski, K. A. & Crofts, S. B. “Scaling and structural properties of juvenile bull kelp (*Nereocystis luetkeana*)” **Integrative Organismal Biology** (2021) DOI: 10.1093/iob/obab022
2. Crofts, S. B. & Stankowich, T. “Stabbing Spines: A review of the Biomechanics and Evolution of Defensive Spines” **Integrative and Comparative Organismal Biology** (2021) DOI: 10.1093/icb/icab099
3. Crofts, S. B, Smith, S. M, and Anderson, P. S. L. “Beyond description: the many facets of dental biomechanics” **Integrative and Comparative Organismal Biology** (2020) DOI: 10.1093/icb/icaa103
4. van Casteren, A. & Crofts, S. B. “The materials of mastication: material science of the humble tooth” **Integrative and Comparative Biology** (2019) icz129. DOI: 10.1093/icb/icz129
5. Anderson, P. S. L, Crofts, S. B., Kim, J. & Chamorro, L. P. Taking a stab at quantifying the energetics of biological puncture. **Integrative and Comparative Biology** (2019) icz078. DOI: 10.1093/icb/icz078
6. Crofts, S. B., Shehata, R. & Flammang, B. E. “Flexibility of heterocercal tails: what can the functional morphology of shark tails tell us about ichthyosaur swimming?” **Integrative Organismal Biology** (2019) 1:1 DOI: 10.1093/iob/obz002 *
7. Crofts, S.B., Lai, Y., Hu, Y. & Anderson, P. S. L. “How do morphological sharpness measures relate to puncture performance in viperid snake fangs?” **Biology Letters** (2019) 15: 20180905 DOI: 10.1098/rsbl.2018.0905
8. Crofts, S.B. & Anderson, P. S. L. “The influence of cactus spine surface structure on puncture performance and anchoring ability is tuned for ecology” **Proc. R. Soc. B** (2018) 285: 20182280. DOI: 10.1098/rspb.2018.2280
Media coverage by: NOVA, Smithsonian.com, Science News, and Discover
9. Gear, M. E., Motley, M. R., Crofts, S. B., Witt A. E., Summers, A. P. & Ditsche, P. “Mechanical properties of harbor seal skin and blubber - a test of anisotropy” **Zoology** (2017) DOI: 10.1016/j.zool.2017.11.002

10. Crofts, S.B., Neenan, J. M., Scheyer, T. M., and Summers, S. P. “Tooth occlusal morphology in the durophagous marine reptiles, Placodontia (Reptilia, Sauropterygia)” **Paleobiology** (2016) DOI: 10.1017/pab.2016.27
11. Kolmann, M.A, Crofts, S.B., Lovejoy, N.R. & Summers, A.P. “The effect of jaw curvature on crushing performance in durophagous stingrays” **Journal of Experimental Biology** (2015) DOI:10.1242/jeb.127340 *
12. Sigwart, J. D., Green, P. A. & Crofts, S. B. “Functional morphology in chitons (Mollusca, Polyplacophora): influences of environment and ocean acidification” **Marine Biology** (2015) DOI: 10.1007/s00227-015-2761-2 *
13. Crofts, S.B. “Finite Element modeling of occlusal variation in durophagous tooth systems” **Journal of Experimental Biology** 218 (2015): 2705-2711
14. Crofts, S.B. & Summers, S. P. “How to best smash a snail – the effect of tooth shape on crushing load” **Journal of the Royal Society Interface** 11 (2014): 20131053
Media Coverage: Der Spiegel
15. Grubich, J.R, Huskey, S., Crofts, S., Orti, G. & Porto, J. “Mega-bites: extreme jaw forces of living and extinct piranhas (Serrisalmidae)” **Scientific Reports** 2 (2012):1009
Media Coverage: National Geographic, Huffington Post, Science News, and Discover
16. Crofts, S.B. & Summers, A.P. “Swimming in the Sahara” **Nature** 472 (2011):177-178
17. Crofts, A.R., Lhee, S., Crofts, S.B., Cheng, J., Rose, S. “Proton pumping in the bc₁ complex: A new gating mechanism that prevents short circuits.” **Biochimica et Biophysica Acta (BBA) - Bioenergetics** 1757.8 (2006): 1019-1034.

Presentations (most recent 5 of 38; *presenting author, † talk, ‡ poster, ** includes student led research):

1. “What is the point of defensive spines?” *† Physical mechanisms of behavior Symposium SICB 2021 (virtual)
2. “Comparing apples to oranges: Tooth performance of frugivorous piranhas and pacus (Serrisalmidae) ‡ ** SICB 2021 (virtual)
3. “Crushing and puncturing: biomechanics of tooth shape” *† Biology at the Cusp: Teeth as a model phenotype for integrating developmental genomics, biomechanics, and ecology Symposium SICB 2020
4. “Variation in snake fang puncture efficiency” *† ICVM 2019
5. “How tool morphology influences energy transmission during high-speed puncture events” † ICVM 2019

Invited Speaker:

1. Dept. Seminar, Cal State Fullerton (9/22/2021)
2. Dept. Seminar, Bates College (10/2019)
3. “FEA using free, open access tools” Natural History and Morphology - Engines of Inspiration Workshop; ASIH 2017
4. Guest Lecture, Swarthmore (11/2016)
5. Integrated Behavioral Research Group Seminar, Princeton University (04/2016)
6. Beta Beta Beta Seminar, McDaniel College (03/2016)
7. Guest Lecture, University of Washington (03/2015)

Teaching Experience:

Instructor

College of the Holy Cross:

Bio 162 (Fall 2020, Sp 2021) – online; (Fall 2021) – in person

Biomechanics (Fall 2021)

Comparative Vertebrate Anatomy (Sp 2021) – class online, lab in person

Bio 114 Biological Principals: The history of life on Earth (Fall 2020) – online

Other:

COSMOS Marine Biology (2009)

Teaching Assistant

Upper level courses: Comparative Anatomy (NJIT; 2016); Functional Morphology and Ecology of Fishes (FHL; 2014); Marine Invertebrate Zoology (FHL; 2012); Invertebrate Paleontology (UW; 2012); Ichthyology (FHL; 2011 - 2014); Invertebrate Zoology (UW; 2010 - 2015); Limnology and Fresh Water Ecology (UCI; 2008); Vertebrate Structure and Function (UChicago; 2007); Dinosaur Science (UChicago; 2006 - 2007)

Introductory courses: Foundations in Evolution and Systematics (UW; 2011); Bio 180 (UW; 2009 - 2010, 2015); Bio 100 LW (UCI; 2007 - 2008); Bio 94 (UCI; 2008 - 2009)

Mentoring

College of the Holy Cross 2021: Brian Saville: Bending mechanics of sea urchin spines; awarded funds from the Weiss Summer Research Program and Ignite Fund

FHL 2021: Research Experience for Undergraduates project for Ayomikun Akinrinade: Puncture mechanics of sea urchin spines

UIUC 2018-2019: Natalie Przybylo awarded the Spyros Kavouras Memorial Undergraduate Summer Research Award for 2019. Unable to accept award due to conflicting summer plans.

UIUC Fall 2018: IB 299 research project for Sarah Hassan, Grace Lewis, Natalie Przybylo, and Valarie Silvano: Effects of ecotype on the functional morphology of three-spined stickleback (*Gasterosteus aculeatus*) spines.

NJIT 2015-2016: Senior Thesis for Rola Shehata: “Flexibility of Shark Tails: *Carcharhinus obscurus*, *Lamna nasus*”

FHL 2014: Blinks-Research Experience for Undergraduates research project for JJ Lomax: “How tooth arrangement affects crushing ability,” manuscript in prep.

FHL 2012-2013: Co-advised (with Martha Groom; UW, Bothell) independent research Project, Jasleena Grewal: “An ecological lens: How does climate change affect predator-prey relationships?”

Funding & Awards:

Marie Skłodowska-Curie Individual Fellowship 2014 (applied), 2016 (Seal of Excellence, Reserve List)

SVP Jackson School of Geosciences Student Member Travel Grant 2014 (funded)

UW Snyder Award 2013 (funded)
SVP Colbert Poster Competition 2012: “Modeling functional trade-offs of teeth from extinct and extant hard prey crushing taxa”
SVP Estes Grant 2012 (funded)
Wainwright Fellowship 2010 (funded), 2011(funded), 2013 (funded), 2014 (funded)
Sigma Xi Grant in Aid of Research 2008 – (funded)
NSF GRFP 2007 (Honorable Mention)

Professional Organizations:

ICVM (2013-2019)	AES (2011,2017)	Sigma Xi (2009-2019)
SICB (2008-2019)	SVP (2011-2017)	Gilbert Ichthyological
ASIH (2011, 2017)	SEB (2013-2016)	Society (2009, 2010)

Service:

Professional:

Have reviewed manuscripts for: Royal Society Proceedings B, Royal Society Open Science, Paleobiology; Zoology, Royal Society Interface, Integrative & Comparative Biology, Evolution, and Functional Ecology.
Hope Zimmerman Committee (2021 – present; University of Akron, Astley Lab)
College of the Holy Cross Biology Dept. Ecologist Search Committee (2020-2021)
Reviewer for the Doris Duke Conservation Scholars Program (2017)
Co-Organizer ASIH Workshop: Natural History and Morphology - Engines of Inspiration (Summer 2017)
UW Dept. of Biology Graduate Programing Committee (2012 – 2014)

Selected Outreach:

Girls/Campers Explore Biology Summer Camp (2018, 2019)
Cephalopod Appreciation Society, (2015)
Marine Expert Day, Friday Harbor Elementary School 2014
Seattle Expand Your Horizons (2013, 2014)
Meet the Mammals at the Burke Museum (2011)
Ask-a-Scientist Night (2008)