





# William B. Ludt

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## Professional Appointments & Experience

- 2024 – present • Associate Curator of Ichthyology  
Natural History Museum of Los Angeles County
  - 2019 – 2024 • Assistant Curator of Ichthyology  
Natural History Museum of Los Angeles County
  - 2020 – 2022 • Associate Editor  
Journal of Natural History
  - 2018 – 2019 • Collette Postdoctoral Fellow in Systematic Ichthyology  
National Museum of Natural History  
Smithsonian Institution
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## Education

- PhD • Louisiana State University 2018  
*Systematics, Ecology, & Evolution*
  - MS • University of Texas at Austin 2011  
*Marine Science*
  - BS • University of Arizona 2009  
*Wildlife Conservation & Management*
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## Research Interests

My research focuses on evolutionary biology, historical biogeography, and ichthyology. More specifically, I am interested in using genomic and morphological approaches to understand the evolutionary history of the world's fishes. My projects range in geographic and taxonomic scope, but rely on museum specimens and the data associated with them. I am interested in finding novel and creative uses for already cataloged museum material, applying new techniques and approaches for obtaining new museum material, and increasing access to the Robert J. Lavenberg fish collection at the NHMLA. Projects associated with the museum collection include increased specimen digitization by adding high-quality photographs, x-rays, and CT scans of specimens, taking new types of samples such as genome-quality tissue samples and microbiome-quality stomach content samples, and providing important metadata associated with collecting events. Additionally, I use museum specimens in an applied fashion to understand the gravity of our impacts on the world around us. Current projects include examining microplastic consumption across time using preserved museum specimens.

## Peer Reviewed Publications

\*Designates Undergraduate Author

- Blackburn DC, Boyer DM, Gray JA, . . . the oVert Project Team (including **WB Ludt**, M Wilson\*, R Ferraro\*, C Fajardo\*), Stanley EL (2024) Increasing the impact of vertebrate scientific collections through 3D-imaging: the open Vertebrate (oVert) Thematic Collections Network. *Bioscience*, 0, 1–18.
- Victor BC, Frable BW, **Ludt WB** (2024) *Halichoeres sanchezi* n. sp., a new wrasse from the Revillagigedo Archipelago of Mexico, tropical eastern Pacific Ocean (Teleostei: Labridae). *PeerJ*, 12:e16828 <https://doi.org/10.7717/peerj.16828>
- Ludt WB**, Corbett EC, Kattawar J, Chakrabarty P, Faircloth BC (2023) A reference genome for Bluegill (Centrarchidae: *Lepomis macrochirus*). *G3: Genes|Genomes|Genetics*, <https://doi.org/10.1093/g3journal/jkad019>
- Ghezelayagh A, Harrington RC, . . . **Ludt WB**, Cowman PF, Friedman M, Price SA, Dornburg A, Faircloth BC, Wainwright PC, Near TJ (2022) Morphological expansion of spiny-rayed fishes following the end-Cretaceous. *Nature Ecology & Evolution*, <https://doi.org/10.1038/s41559-022-01801-3>.
- Girard MG, Davis MP, Hui TH, Wedd D, Chakrabarty P, **Ludt WB**, Summers AP, Smith WL (2022) Phylogenetics of archerfishes (Toxotidae) and evolution of the toxotid shooting apparatus. *Integrative Organismal Biology*, <https://doi.org/10.1093/iob/obac013>
- Ludt WB**, Clardy TR (2022) First detection of biofluorescence in a deep-sea anglerfish. *Journal of Fish Biology*, 100(3): 843–846.
- Alda F, **Ludt WB**, Elías DJ, McMahan CD, Chakrabarty P (2021) Comparing ultraconserved elements and exons for phylogenomic analyses of Middle American cichlids: when data agree to disagree. *Genome Biology and Evolution*, 13(8), evab161.
- Ludt WB** (2021) Missing in the middle: A review of equatorially disjunct marine taxa. *Frontiers in Marine Science*, 8:660984. <https://doi.org/10.3389/fmars.2021.660984>
- Bell KC, Adams BJ, Brown BV, **Ludt WB**, Pauly GB, Shultz AJ, Vendetti JE (2021) Museums are critical infrastructure for studying urban biodiversity. *Bioscience*, 71(5), 433.
- Ludt WB**, Myers CE (2021) Distinguishing between dispersal and vicariance: A novel approach using anti-tropical taxa across the fish Tree of Life. *Journal of Biogeography*, 48(3), 577–589.
- Shultz AJ, Adams BJ, Bell KC, **Ludt WB**, Pauly GB, Vendetti JE (2021) Natural history collections are critical and underutilized resources for contemporary and future studies of urban evolution. *Evolutionary Applications*, 14, 233–247.
- Ludt WB**, Jabado RW, Al Hameli SM, Freeman L\*, Teruyama G\*, Chakrabarty P, Al Dhaheri SS (2020) Establishing a reference collection and DNA barcoding the coastal fishes of the United Arab Emirates. *Journal of the Ocean Science Foundation*, 35, 54–64.
- Hart PB, Niemiller NM, Burress ED, Armbruster JW, **Ludt WB**, Chakrabarty P (2020) Cave-adapted evolution in the North American Amblyopsid fishes inferred using phylogenomics and geometric morphometrics. *Evolution* 74(5), 936–949.
- Ludt WB**, Rocha LA, Chakrabarty P (2020) The first mitochondrial genomes of sawtail surgeonfishes (Acanthuridae: *Prionurus*). *Mitochondrial DNA Part B* 5(1), 212–213, DOI: 10.1080/23802359.2019.1699465
- Chakrabarty P, **Ludt WB**, Parker S (2019) The Louisiana State University Museum of Natural Science fish collections; An important modern collection of neotropical fishes and DNA. *Boletim Sociedade Brasileira de Ictiologia* 29, 49–52.

## Peer Reviewed Publications Continued

- Tea YK, Van Der Wal C, **Ludt WB**, Gill A, Lo N, Ho S (2019) Boomeranging around Australia: Historical biogeography and systematics of the anti-equatorial fish *Microcanthus strigatus* (Teleostei: Microcanthidae). *Molecular Ecology* 28(16), 3371–3785.
- Ludt WB**, BurrIDGE CP, Chakrabarty P (2019) A taxonomic revision of Cheilodactylidae and Latridae (Centrarchiformes: Cirrhitidae) using morphological and genomic characters. *Zootaxa* 4585(1): 121–141.
- Kenaley CP, State A, **Ludt WB**, Chakrabarty P (2019) Comparative functional and phylogenomic analyses of host association in the remora family Echeneidae (Percomorphia: Carangiformes). *Integrative Organismal Biology* 1(1), obz007, <https://doi.org/10.1093/iob/obz007>
- Crandall ED, Riginos C, ... **Ludt WB**, Pandolfi J, Toonen RJ, Gaither MR (2019) The molecular biogeography of the Indo-Pacific: testing hypotheses with multispecies genetic patterns. *Global Ecology & Biogeography* 28(7), 943–960.
- Ludt WB**, Bernal MA, Kenworthy E\*, Salas E, Chakrabarty P (2019) Investigating species limits of surgeonfishes from the Eastern Pacific (Acanthuridae: *Prionurus*) using genomic, ecological, and morphological data. *Ecology & Evolution* 9(7), 4001–4012.
- Alda F, Tagliacollo VA, Bernt MJ, Waltz BT, **Ludt WB**, Faircloth BC, Alfaro MA, Albert JS, Chakrabarty P (2019) Resolving deep nodes in an ancient radiation of neotropical fishes in the presence of conflicting signals from incomplete lineage sorting. *Systematic Biology*, 68(4), 573–593.
- Ludt WB**, Morgan L\*, Bishop J, Chakrabarty P (2018) A quantitative and statistical biological comparison of three semi-enclosed seas: The Red Sea, the Persian (Arabian) Gulf, and the Gulf of California. *Marine Biodiversity* 48(4), 2119–2124.
- Chakrabarty P, Faircloth BC, Alda F, **Ludt WB**, Mcmahon CD, Near TJ, ... Alfaro ME (2017) Phylogenomic systematics of Ostariophysan fishes: ultraconserved elements support the surprising non-monophyly of Characiformes. *Systematic Biology*, 66(6), 881–895.
- Ng HH, Tan HH, Lim KKP, **Ludt WB**, Chakrabarty P (2015) Fishes of the eastern Johor Strait. *The Raffles Bulletin of Zoology*, Supplement 31.
- Ludt WB**, Rocha LA, Erdmann MV, Chakrabarty P (2015) Skipping across the tropics: the evolutionary history of sawtail surgeonfishes (Acanthuridae: *Prionurus*). *Molecular Phylogenetics & Evolution* 84, 166–172.
- Derouen VA, **Ludt WB**, Ho H, Chakrabarty P (2015) Examining evolutionary relationships and shifts in depth-preferences in batfishes (Lophiiformes: Ogocephalidae). *Molecular Phylogenetics & Evolution* 84, 27–33.
- Ludt WB**, Rocha LA (2015) Shifting seas: the impacts of Pleistocene sea-level fluctuations on the evolution of tropical marine taxa. *Journal of Biogeography* 42, 25–38.
- Ludt WB**, Bernal MA, Bowen BW, Rocha LA (2012) Living in the past: phylogeography and population histories of Indo-Pacific wrasses (genus *Halichoeres*) in shallow lagoons versus outer reef slopes. *PloS One*, 7(6) e38042.

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## Other Publications

- Ludt WB** (2022) A review of: Miller and Lea's Guide to the Coastal Marine Fishes of California. *Ichthyology & Herpetology*, 110(2), 425–426.

## Other Publications Continued

- Thacker CE, **Ludt WB**, Pauly GB (2021) Obituary: Richard Francis Feeney (1954–2021). *Ichthyology & Herpetology*, 109(4), 1085–1089.
- Ludt WB** (2016) A review of: A Field Guide to Coastal Fishes from Alaska to California. *Copeia*, 104(2), 611–612.
- Ludt WB** (2015) A review of: Review of Atlantic and Eastern Pacific Anthiine Fishes (Teleostei: Perciformes: Serranidae), with Descriptions of Two New Genera. *Copeia*, 103(1), 229–230.
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## Awards & Grants

- C0223003** Plastics Past and Present: Understanding historical trends of microplastic consumption in California marine food webs to better inform future marine management (\$357,564) 2023 – 2025  
PI: William B. Ludt, Co-PI: Aaron Celestian  
*California Sea Grant*
- DBI 2215184** MRI: Acquisition of a CT Scanner for Research, Digitization, and Education at the NHMLA (\$258,537) 2022 – 2025  
PI: William B. Ludt, Co-PI: Joel Martin  
*National Science Foundation*
- DBI 2001443** DIGITIZATION PEN: CryptoVert – Digitizing small-bodied cryptobenthic fishes for the oVertTCN (\$218,489) 2020 – 2024  
PI: William B. Ludt  
*National Science Foundation*
- Collette Postdoctoral Fellowship in Systematic Ichthyology** (\$54,700) 2018 – 2019  
*National Museum of Natural History, Smithsonian Institution*
- DEB 1701323** DISSERTATION RESEARCH: Phylogenomics and Evolutionary Rates associated with Salinity and Thermal Shifts in Centrarchiformes (\$17,967) 2017 – 2019  
*National Science Foundation*
- NSF Diversification Rates BAMB Workshop Travel Award** (\$600) 2017  
*Oregon State University*
- SSE Travel Award** (\$500) 2017  
*Evolution Meeting, Portland, OR*
- Outstanding Graduate Student Award** 2016  
*LSU Museum of Natural Science*
- Schultz Fund Recipient** (\$3,065) 2016  
*NMNH Smithsonian Institution*
- Ron & Mary Neal PUF Fellowship** (\$11,525) 2016  
*Louisiana State University*
- Biograds Travel Fund** (\$1,100) 2013 – 2016  
*Louisiana State University*
- Grants in Aid of Research** (\$720) 2015  
*Sigma Xi*

## Awards & Grants Continued

<b>Lerner-Gray Memorial Fund for Marine Research</b> (\$2,000) <i>American Museum of Natural History</i>	2014
<b>McDaniel Travel Award</b> (\$400) <i>Louisiana State University</i>	2013
<b>Professional Development Award</b> (\$500) <i>University of Texas at Austin</i>	2011
<b>REU Grant, Horn Point Laboratory, University of Maryland</b> <i>National Science Foundation</i>	2008

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## Select First Author Presentations

- Ludt WB**, Unmack PJ, Clements KD, Sandel M, Hobbs JPA, Bernardi G, Near TJ, Chakrabarty, P. 2023 Resolving the evolutionary relationships of the order Centrarchiformes. Annual ASIH Meeting, Norfolk, VA & 11<sup>th</sup> IPFC Meeting, Auckland, NZ.
- Ludt WB**, Clements KD, Hobbs JPA, Bernardi G, Unmack PJ, Chakrabarty, P. 2021 Examining the Evolutionary Relationships of the Terapontoidei using Ultraconserved Elements. Annual ASIH Meeting, Phoenix, AZ.
- Ludt WB**, Clements KD, Hobbs JPA, Bernardi G, Unmack PJ, Chakrabarty, P. 2021 Examining the Evolutionary Relationships of the Terapontoidei using Ultraconserved Elements. Annual ASIH Meeting, Phoenix, AZ.
- Ludt WB**, Collette BB, Baldwin C. Osteology of paired and median fins in Hemiramphidae and Exocoetidae with taxonomic comments. 2019 Annual ASIH Meeting, Snowbird, UT.
- Ludt WB**, Bernal MA, Kenworthy E\*, Salas E, Chakrabarty P. Investigating Species Limits of Surgeonfishes in the Eastern Pacific (Acanthuridae: *Prionurus*). 2018 Annual ASIH Meeting, Rochester, NY.
- Ludt WB**, Burrige CP, Near TJ, Chakrabarty P. Understanding anti-tropical distributions in Centrarchiformes. 2017 ASIH Annual Meeting, Austin, TX & 10<sup>th</sup> Indo-Pacific Fish Convergence, Tahiti, French Polynesia.
- Ludt WB**, Bernal MA, Salas E, Chakrabarty P. Speciation in the Tropical Eastern Pacific? A case study with *Prionurus* surgeonfishes. 2017 Evolution Meeting, Portland, OR.
- Ludt WB**, Myers CE. What drives anti-tropical distribution across the fish tree of life? 2016 ASIH Annual Meeting, New Orleans, LA & 2017 IBS Meeting, Tucson, AZ.
- Ludt WB**, Brown JM, Burrige CP, Chakrabarty P. An investigation of branch lengths using ultraconserved elements. 2016 Evolution Meeting, Austin, TX.
- Ludt WB**, Burrige CP, Chakrabarty P. What, if anything, is a morwong? 2015 Evolution Meeting, Guarujá, Brazil & 2015 Annual ASIH Meeting Reno, NV.
- Ludt WB**, Rocha LA, Erdmann MV, Chakrabarty P. Crossing the tropics: insights from temperately restricted *Prionurus* surgeonfishes. 2014 ASIH Annual Meeting, Chattanooga, TN.
- Ludt WB**, Chakrabarty P, Rocha LA. Living outside the coral triangle: the evolutionary history and biogeography of the genus *Prionurus*. 9<sup>th</sup> Indo-Pacific Fish Conference, Okinawa, Japan & 2013 ASIH Annual Meeting, Albuquerque, NM.

## Select First Author Presentations Continued

**Ludt WB**, Bernal MA, Bowen B, Rocha LA. Sea level fluctuations and diversity in two habitats: Comparisons of two lagoon and two seaward reef wrasses (Genus *Halichoeres*). 2011 ASIH Annual Meeting, Minneapolis, MN.

**Ludt WB**, Pierson J, Kimmel D, Roman M. Determining egg development rates of *Acartia tonsa* in the Chesapeake Bay using a DAPI staining technique and its significance (Poster Presentation). 2009 CERF Conference, Portland, OR.

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## Invited Seminars

CSU Northridge (2023)

Occidental College (2022)

Southeastern Louisiana University (2017)

UC Riverside (2023)

Scripps Institution of Oceanography (2021)

Louisiana State University (2012)

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## Mentorship/Supervision

Mentor to the following staff, volunteers, undergraduate and graduate students:

Link Morgan (LSU)

Erica Kenworthy (LSU)

Gabe Navar (LSU)

Mike Guevara (NHMLA)

Cindy Fajardo (NHMLA)

Bridget Altman (NHMLA)

Jessica Flores (NHMLA)

Glynn O'Neill (LSU)

Chris Crowe (LSU)

Layne Freeman (LSU)

Anna-Lisa Taylor (NHMLA)

Roman Ferraro (USC)

Madison Wilson (CSUF)

Clay Pollock (NHMLA)

Genta Teruyama (LSU)

Winston Anthony (UT)

Caris Han (USC)

Joshua Wheelwright (NHMLA)

Suzie Boyadzhyan (GCC)

Carlos Cruz (NHMLA)

Jazmine Gallardo (NHMLA)

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## Professional Societies

American Society of Ichthyologists and Herpetologists

Society of Systematic Biologists

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## Teaching Experience

Organizer & Leader • UCE Workshop for Louisiana Ichthyologists  
*Louisiana State University* 2015 & 2016

Instructor • Fish Identification Course 2016  
*Kuwait Institute of Scientific Research*

Teaching Assistant • Introductory Biology & Ichthyology 2013 – 2018  
*Louisiana State University*

Teaching Assistant • Oceanography 2009 – 2010  
*University of Texas at Austin*

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## Consultancy

Ichthyology Consultant • Middle East Fishes 2016 & 2018  
*Environmental Agency of Abu Dhabi*

Ichthyology Consultant • Gulf of Mexico Fishes 2016  
*Field Museum of Natural Science*

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## Outreach & Public Service

'Science of SpongeBob' Nickelodeon scientist	2021 – 2024
'Science of Slime' Nickelodeon scientist	2020
Multiple Skype a Scientist Events	2020
Panelist • Night of Ideas, A Rx for the seven seas <i>Natural History Museum of Los Angeles County</i>	2020
Main Presenter • Diver's Night <i>Eco Dive Center</i>	2019
Main Presenter & Tour Guide • Night at the Museum Series <i>LSU Museum of Natural Science</i>	2016
Tour Guide • Louisiana Master Naturalists <i>LSU Museum of Natural Science</i>	2015 – 2016
LSUMNS Exhibitor • Our Finned Friends <i>USS Kidd Veterans Memorial &amp; Museum</i>	2015 – 2016
Graduate Mentor • BIOS Program <i>Louisiana State University</i>	2014
LSUMNS Exhibitor • Ocean Commotion <i>Louisiana State University</i>	2013 – 2018
Judge • Environmentors Science Fair <i>Baton Rouge, LA</i>	2013
UTMSI Representative • 2 <sup>nd</sup> Annual Coastal Bend Feria Para Apender <i>Corpus Christi, TX</i>	2011
Dive Program Volunteer <i>Texas State Aquarium</i>	2010 – 2011
Exhibitor • Explore UT <i>University of Texas at Austin</i>	2010

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## Professional Service

Member of the Raney Fund Committee <i>American Society of Ichthyologists and Herpetologists</i>	2024 – 2026
Storer Committee Chair • ASIH Student Judging Committee <i>American Society of Ichthyologists and Herpetologists</i>	2023
Ad Hoc Reviewer <i>National Science Foundation</i>	2022, 2023, 2024
Elected member of the ASIH Board of Governors <i>American Society of Ichthyologists and Herpetologists</i>	2022 – 2026
Member of the Robert K. Johnson Award Committee <i>American Society of Ichthyologists and Herpetologists</i>	2022 – 2024
Member of the Education and Human Resources Committee <i>American Society of Ichthyologists and Herpetologists</i>	2021 – Present
Grant Review Panelist <i>National Science Foundation DEB</i>	2021

## Professional Service Continued

Member of the Collections Committee <i>American Society of Ichthyologists and Herpetologists</i>	2019 – Present
Stoye Committee Chair • ASIH Student Judging Committee <i>American Society of Ichthyologists and Herpetologists</i>	2019
Student Representative • Web Content Committee <i>American Society of Ichthyologists and Herpetologists</i>	2017 – 2018
Student Representative • Long Range Planning & Policy Committee <i>American Society of Ichthyologists and Herpetologists</i>	2017 – 2018
Chair • Committee on Graduate Student Participation <i>American Society of Ichthyologists and Herpetologists</i>	2016
President • Biograds <i>Louisiana State University</i>	2014 – 2015
Committee Member • Graduate Student Book Raffle <i>American Society of Ichthyologists and Herpetologists</i>	2014
Seminar Coordinator <i>LSU Museum of Natural Science</i>	2013 – 2014

Manuscript Reviews for the Following Peer Reviewed Journals:

*Conservation Genetics, Copeia, Coral Reefs, Diversity, Frontiers in Ecology and Evolution, Heredity, Integrative and Comparative Biology, Journal of Biogeography, Journal of Fish Biology, Journal of the Marine Biological Association of the United Kingdom, Journal of Natural History, Marine & Freshwater Research, Mitochondrial DNA Part B: Resources, Molecular Ecology, Molecular Phylogenetics & Evolution, PLoS One, Proceedings of the Royal Society B, Science Advances, Systematics and Biodiversity, Systematic Biology, Zookeys, Zootaxa*

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## International Scientific Expeditions

<b>Mexico</b> Community science and collecting expedition to the Gulf of California.	2023
<b>St. Helena Island</b> Collecting expedition examining connectivity and endemics in south Atlantic.	2023
<b>Mexico</b> Community science and collecting expedition to the Revillagigedos.	2022
<b>Costa Rica</b> Freshwater collecting trip on the Atlantic slope	2019
<b>Curacao</b> Targeted collection of lionfishes and gobies with scuba and sub dives	2019
<b>Tahiti, French Polynesia</b> General market collecting of South Pacific fishes	2017
<b>United Arab Emirates</b> General trawling collections in coastal areas	2016



## International Scientific Expeditions Continued

<b>Brazil</b>	2015
General collecting on the Amazon & Tapajós Rivers	
<b>Panama</b>	2015
Targeted collecting trip for marine reef fishes in the offshore Pacific islands	
<b>Kuwait &amp; United Arab Emirates</b>	2015
General collecting in the Arabian Gulf	
<b>Kuwait</b>	2014
General collecting in the Arabian Gulf in collaboration with KISR	
<b>Costa Rica</b>	2014
Collected marine and freshwater fishes in Guanacaste	
<b>Japan</b>	2013
Market sampling Tsukiji – at the world’s largest fish market	
<b>Singapore</b>	2012
Three-week survey of Palau Ubin and the Johore Straits	
<b>Gulf of Mexico</b>	2012 – 2014
Three research cruises collecting benthic fishes	
<b>Gulf of California</b>	2007 – 2008
Five research expeditions to the northern Gulf of California	