

RYAN MARC CARNEY

Assistant Professor of Digital Science • National Geographic Explorer
Department of Integrative Biology, University of South Florida
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EDUCATION

PhD	2016	Brown University , Providence, RI Ecology & Evolutionary Biology; advisor Prof. Stephen Gatesy Thesis: <i>Evolution of the archosaurian shoulder joint and the flight stroke of Archaeopteryx</i>
MS	2013	Ecology & Evolutionary Biology
MPH	2010	Yale School of Medicine , New Haven, CT Epidemiology of Microbial Diseases; advisor Prof. Durland Fish Thesis: <i>GIS-based early warning system for predicting high-risk areas of dengue virus transmission, Ribeirão Preto, Brazil</i> . Winner of Dean's Prize for Outstanding Thesis.
MBA	2010	Yale School of Management , New Haven, CT Concentration: Technology
BA (Honors)	2003	University of California - Berkeley , Berkeley, CA Integrative Biology; advisor Prof. Kevin Padian Thesis: <i>Phylogenetically testing the hypothesis of secondary flightlessness within Maniraptoriformes</i>
BA	2003	Art Practice

ACADEMIC POSITION

2016 - present **Assistant Professor of Digital Science, University of South Florida**, Tampa, FL.
Department of Integrative Biology

RESEARCH INTERESTS

From *Archaeopteryx* to Zika, I study dinosaurs and diseases using interdisciplinary methodologies and cutting-edge digital technologies:

- **Dinosaurs.** My research primarily focuses on the iconic *Archaeopteryx* and extant dinosaurs. Methodologies include 3D imaging, modeling, analysis, and animation -- along with a joint surface approach and **scientific motion transfer** -- to investigate functional morphology and the evolution of motions such as the avian flight stroke. I also work in the **virtual reality and augmented reality** space, translating research into next-generation visualizations that bring dinosaurs "back to life" for outreach and pedagogy.
- **Diseases.** My epidemiology research primarily focuses on the surveillance and control of **mosquito-borne diseases** such as malaria, dengue, West Nile virus, and Zika. Through an **NSF-funded** global research collaboration with **NASA** and the **CDC**, I lead a team that identifies disease-spreading and invasive mosquitoes using **artificial intelligence**, along with **citizen science** data from three partner apps: iNaturalist, Mosquito Alert, and Mosquito Habitat Mapper. My research also leverages geographic information systems, remote sensing, and spatial modeling techniques like the DYCAST early warning system, to model vector habitats, detect disease hot spots, and enable the strategic targeting of control efforts.

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SELECTED GRANTS AND AWARDS

2021	University of South Florida – Outstanding Research Achievement Award	\$2,000
2021	National Science Foundation – Research Experiences for Undergraduate Grant	\$16,000
2020	National Science Foundation – SCH: INT: Mosquito-Borne Diseases, Role: PI [link]	\$900,000
2020	University of South Florida – COVID-19 Research Grant, Role: Co-PI	\$25,000
2020	University of South Florida – Outstanding Undergraduate Teaching Award	\$2,000
2018	University of South Florida – Outstanding Faculty Award	N/A
2017	National Geographic Society – Emerging Explorer Award	\$10,000
2014	National Geographic Society – Waitt Research Grant	\$13,992
2013	National Geographic Society – Committee for Research and Exploration Grant	\$13,800
2012	National Geographic Society – Waitt Research Grant	\$14,971
2011	National Science Foundation – Graduate Research Fellowship	\$127,900
2009–2011	National Science Foundation – SGER Research Grant, in collab. with J. Gauthier	\$41,996
2010	National Geographic Society – Expeditions Council Research Grant	\$5,745
2010	National Geographic Society – Waitt Research Grant	\$4,950
2007–2010	Yale University – Dean’s Scholarship, merit-based award to top 5% of students	\$22,400
2007–2008	Yale University – Susan Dwight Bliss Scholarship	\$5,000
2008	Centers for Disease Control – Graduate Training Fellowship	\$7,000
2005	California Department of Public Health – DYCAST, Role: PI	\$200,000
1999–2003	University of California, Berkeley – Alumni Leadership Scholarship	\$5,000
1997	Boy Scouts of America – Eagle Scout	N/A

TEACHING EXPERIENCE

University of South Florida, Tampa, FL 1/17 - present

Digital Dinosaurs (BSC 4454C/6932 lecture+laboratory course, 3 credits, 24 undergraduate/graduate students):

Designed and developed technology-focused curriculum, delivered lectures, and ran laboratory sections.

- **Synopsis:** This course provides a comprehensive exploration, including some hands-on training, of the cutting-edge digital tools used in paleontology. While the subject matter focuses on dinosaurs, the techniques will be applicable to a variety of disciplines. TV coverage (2017–19): [link](#)

University of South Florida, Tampa, FL 1/19 - present

Comparative Vertebrate Anatomy (ZOO 3713C lecture+laboratory course, 5 credits, 96 undergraduate students):

- Lectured twice a week and supervised 4-6 graduate Teaching Assistants (TAs) and 4-5 undergraduate TAs involved in the 4 dissection-based laboratory sections.
- **Synopsis:** Designed for undergraduates in biology or the biomedical sciences – particularly pre-veterinary and pre-medicine – this course covers the anatomy of the vertebrates, emphasizing the comparative, functional, and evolutionary aspects of these animals.

University of South Florida, Tampa, FL 1/17 - present

- Other graduate courses: **Advances in Digital Biology** (BSC 6932), **Advances in Life Sciences** (BSC 6393), **Directed Research** (BSC 6910/7910), **Doctoral Dissertation** (BSC 7980), **Independent Study** (BSC 6905), **Master’s Thesis** (BSC 6971)
- Other undergraduate courses: **Honors Thesis I and II** (IDH 4970), **Undergraduate Research** (BSC 4910)

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Alpert Medical School, Brown University, Providence, RI 8/11 - 1/12
Graduate Teaching Instructor, **Human Anatomy** (BIOL 3664 IMS I)
• Taught cadaver-based laboratory sections for >100 medical students (>100 hours of laboratory).
• Designed rotator cuff prosection, dissected anatomy; presented knee and bovine heart/lung prosections.
• Wrote questions for written and practical examinations; proctored practical examinations.

School of Medicine, Yale University, New Haven, CT 9/09 - 12/09
Teaching Fellow, **GIS Applications in Epidemiology and Public Health** (Biostatistics 511; graduate level)
• Taught course lab sections using geographic information systems software; graded assignments.

Department of Art, University of California, Berkeley, CA 1/05 - 5/05
Teaching Assistant, **Digital Sculpture** (Art Practice 160; undergraduate level)
• Taught lab sections, lectured, and supervised and trained students to use 3D laser scanning equipment.

Invited course lectures

- “Digital Epidemiology” for graduate course at USF College of Public Health, 2020
- “Surveillance & Control of Mosquito-Borne Diseases” for graduate course at USF College of Public Health, 2019
- “Visualizing GIS in 3D and Augmented Reality” for graduate course at USF College of Public Health, 2017
- “Zika Early Warning System” for graduate course at USF College of Public Health, 2017
- “Archosaurs and *Archaeopteryx*” for undergraduate biology course at U Mass Dartmouth, 2016
- “Bird and Dinosaur Origins” for undergraduate biology course at Brown University, 2015
- “West Nile Virus Risk Modeling” for graduate public health course at Yale University, 2009
- “GIS and Public Health Surveillance” for graduate public health course at UC Berkeley, 2007

MENTORING & TRAINING

Postdoctoral Researchers

- *previously*: **Dr. Phil Morris**. Integrative Biology (2019–20); **Dr. Toni Panaou**. Integrative Biology (2018)

Graduate Students

- **Alex Kirk**. PhD candidate, Integrative Biology. Advisee (2017–present)
- **Theron Kantelis**. PhD student, Integrative Biology. Advisee (2021–present)
- **Sarah Guzinski**. Masters student, Integrative Biology. Advisee (2021–present)

Graduate Committees

- **Sean Beeman**. PhD candidate, College of Public Health (2018–present)
- **Christian Brown**. PhD student, Integrative Biology (2018–present)
- **Pablo Garcia**. PhD student, Integrative Biology (2020–present)
- **Austin Smith**. PhD student, Integrative Biology (2021–present)
- *previously*: **Nils Tack**. PhD, Integrative Biology (2019–21); **Meredith Krause**. PhD, Integrative Biology (2019–20)

Graduate Independent Study

- **Jade Brunicardi**. USF Morsani College of Medicine. Mentee for Capstone Research (2021–present)
- *previously*: **Disha Jain**. MPH candidate, College of Public Health (2020); **William Gardner**. MPH candidate, College of Public Health (2017–19)

Undergraduate Students

- **Sebastian Alvarez de Araya**. Environmental Biology, Mathematics minor (2020–present)
- **Zia Coblentz**. Honors College / Anthropology; Honors Thesis Committee Member for (2020–present)

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- **Kristen Hodne**. Honors College / Biomedical Sciences and Public Health (2020-present)
- **Karlene Rivera**. Biomedical Sciences, Psychology / Honors College (2021-present)
- **Israel Rivera-Molina**. Geosciences (2020-present)
- **Elise Samuelson**. Integrative Biology (2021-present)
- **Kaleb Smallwood**. Geosciences, Spanish minor (2020-present)
- *previously*: **Connor Mapes**. Honors College / Environmental Science and Policy, GIS minor (2018-21); Honors Thesis Advisor for (2019-21); **Alec Baines**. Integrative Biology, Geosciences minor (2017-present); **Mary Williams**. Honors College / Engineering (2017-20); **Ahmed Abd-Elrahman**. Computer Engineering, Computer Science (2018-19); **Jim Mirzakhlov**. Honors College / Engineering (2017-18); **Kaleigh Nelson**. Integrative Biology, Geosciences (2017); **Manuel Regalado**. Honors College / Chemical Engineering (2017-18); **Michael Rey**. College of Public Health (2016-17)

Researchers

- *previously*: **Vincent Meijer**. Staff Research Associate (2017, 2021); **Myriam Van Walsum**. Staff Research Associate (2017)

PUBLICATIONS

citations: 955 • h-index: 12 • Google Scholar profile: [\[link\]](#)

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- 27). Griffin CT, Botelho JF, Hanson M, Fabbri M, **Carney RM**, Norell MA, Egawa S, Gatesy SM, Nesbitt SJ, Bhullar B-AS. The avian pelvis possesses ancestral dinosaurian morphology early in development. *Nature*
- 26). Cieri RL, Turner ML, **Carney RM**, Falkingham PL, Kirk AM, Wang T, Jensen B, Novotny J, Tveite J, Gatesy SM, Laidlaw DH, Kaplan H, Moorman AFM, Howell M, Engel B, Cruz C, Smith A, Gerichs W, Lian Y, Schultz JT, & Farmer CG. 2021. Virtual and augmented reality: New tools for visualizing, analyzing, and communicating complex morphology. *Journal of Morphology* doi.org/10.1002/jmor.21421. [pdf](#) + [video](#)
- 25). **Carney RM**, Tischlinger H, & Shawkey MD. 2020. Evidence corroborates identity of isolated fossil feather as a wing covert of *Archaeopteryx*. *Scientific Reports* 10:15593. [\[link\]](#). Press: [National Geographic](#), [The New York Times](#), [USF](#); Altmetric: 99th percentile of tracked articles of a similar age in all journals; 99th percentile "" in *Scientific Reports*; selected by journal for their *Editor's choice: dinosaurs* collection.
- 24). Minakshi M, Bharti P, McClinton III WB, Mirzakhlov J, **Carney RM**, & Sriram Chellappan. 2020. Automating the surveillance of mosquito vectors from trapped specimens using computer vision techniques. *Proceedings of ACM COMPASS* [20-25% acceptance rate]. 11 pages.
- 23). Schwarz D, Kundrát M, Tischlinger H, Dyke G, & **Carney RM**. 2019. Ultraviolet light illuminates the avian nature of the Berlin *Archaeopteryx* skeleton. *Scientific Reports* 9:6518.
- 22). Baier DB, Garrity BM, Moritz S, & **Carney RM**. 2018. *Alligator mississippiensis* sternal and shoulder girdle mobility increase stride length during high walks. *Journal of Experimental Biology* 221(22):jeb186791.
- 21). Leandro-Reguillo P, Panaou T, **Carney R**, Jacob BG. 2017. Fuzzification of multi-criteria proxy geoclassifiable vegetation and landscape biosignature estimators to predict the potential invasion of *Aedes aegypti* in Barcelona, Spain. *International Journal of Geographic Information System* 4(2):1-19. [\[link\]](#)
- 20). **Carney RM**. 2016. Evolution of the archosaurian shoulder joint and the flight stroke of *Archaeopteryx*. PhD dissertation, *Brown University*.

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- 19). Lindgren J, Sjövall P, **Carney RM**, Cincotta A, Uvdal P, Hutcheson SW, Gustafsson O, Lefèvre U, Escuillie F, Heimdal J, Engdahl A, Gren JA, Kear BP, Wakamatsu K, Yans J, & Godefroit P. 2015. Molecular composition and ultrastructure of Jurassic paravian feathers. *Scientific Reports* 5. [[link](#)]
- 18). Lindgren J, Sjövall P, **Carney RM**, Uvdal P, Gren JA, Dyke G, Schultz BP, Shawkey MD, Barnes KR, & Polcyn MJ. 2014. Skin pigmentation provides evidence of convergent melanism in extinct marine reptiles. *Nature* 506(7489):484–8. [[link](#)]
- 17). **Carney RM**, Vinther J, Shawkey MD, D’Alba L, & Ackermann J. 2012. New evidence on the colour and nature of the isolated *Archaeopteryx* feather. *Nature Communications* 3:637 doi: 10.1038/ncomms1642. [featured in >140 articles from 30 countries, including the *The New York Times*; see Outreach] [[link](#)][[video](#)]
- 16). Vinther J, Jell P, Kampouris G, **Carney RM**, Racicot RA, & Briggs DEG. 2012. The origin of multiplacophorans – convergent evolution in aculiferan molluscs. *Palaeontology* 55(5):1007–19. [[link](#)][[animation](#)]
- 15). **Carney RM**, Ahearn SC, McConchie A, Glaser C, Jean C, Barker C, Park B, Padgett K, Parker E, Aquino E, & Kramer V. 2011. Early warning system for West Nile virus risk areas, California, USA. *Emerging Infectious Diseases* 17(8):1445-54. [[link](#)]
- 14). **Carney RM**. 2010. GIS-based early warning system for predicting high-risk areas of dengue virus transmission, Ribeirão Preto, Brazil. Masters thesis, *Yale University*. [winner of Dean’s Prize for Outstanding Thesis] [[link](#)]
- 13). **Carney RM**, Ahearn SC, McConchie A, Glaser C, Jean C, Barker C, Park B, Padgett K, & Kramer V. 2008. Implementation of the spatiotemporal DYCAST risk modeling system to predict human West Nile virus cases in California, 2005. In: *5th International Conference on Geographical Information Systems (ICGIS-2008): Proceedings, July 2-5, 2008*. Demirci, A. (Ed.), Fatih University Publications, Istanbul, Vol. 2:657-63.
- 12). **Carney RM**, Husted S, Jean C, Glaser C, & Kramer V. 2008. Efficacy of aerial spraying of mosquito adulticide in reducing incidence of West Nile virus in humans, Sacramento County, California, 2005. *Emerging Infectious Diseases* 14(5):747-54. [[link](#)]
- 11). Crosbie SP, Koenig WD, Reisen WK, Kramer VL, Marcus L, **Carney RM**, Pandolfino E, Bolen GM, Crosbie LR, Bell DA, Ernest HB. 2008. Early impact of West Nile virus on the Yellow-billed Magpie (*Pica nuttalli*). *The Auk* 125(3):542-50.
- 10). Feiszli T, Husted S, Park B, Eldridge B, Fang Y, Reisen WK, Jean C, Cossen C, **Carney R**, Parker E, Erickson C, McQuarry A, Kramer V. 2008. Surveillance for mosquito-borne encephalitis virus activity in California, 2007. *Proceedings and Papers of the MVCAC* 76:108-23.
- 9). Scott T, Lee P-Y, Padgett K, **Carney R**, Husted S, Koenig W. 2008. The impact of West Nile virus on birds in California’s hardwood rangelands. *Proceedings of the Sixth Symposium on Oak Woodlands* 151-63.
- 8). Padgett KA, Reisen WK, Kahl-Purcell N, Fang Y, Cahoon-Young B, **Carney R**, Anderson N, Zucca L, Woods L, Husted S, Kramer V. 2007. West Nile virus infection in tree squirrels (Rodentia: Sciuridae) in California, 2004-2005. *American Journal of Tropical Medicine and Hygiene* 76(5):810-3.
- 7). Feiszli T, Park B, Kramer V, Kjemtrup A, Eldridge B, Fang Y, Reisen WK, Baylis E, Jean C, Glover J, **Carney R**, Padgett K, Erickson C, Husted S. 2007. Surveillance for mosquito-borne encephalitis virus activity in California, 2006. *Proceedings and Papers of the MVCAC* 75:48-59.

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- 6). Reisen WK, Barker CM, **Carney R**, Lothrop HD, Wheeler SS, Wilson JL, Madon MB, Takahashi R, Carroll B, Garcia S, Fang Y, Shafii M, Kahl N, Ashtari S, Kramer V, Glaser C, Jean C. 2006. Role of corvids in epidemiology of West Nile virus in southern California. *Journal of Medical Entomology* 43(2):356-67.
- 5). Reisen WK, Fang Y, Lothrop HD, Martinez VM, Wilson J, O'Connor P, **Carney R**, Cahoon-Young B, Shafii M, Brault AC. 2006. Overwintering of West Nile virus in southern California. *Journal of Medical Entomology* 43(2):344-55.
- 4). Padgett KA, Cahoon-Young B, **Carney R**, Woods L, Read D, Husted S, Kramer V. 2006. Field and laboratory evaluation of diagnostic assays for detecting West Nile virus in oropharyngeal swabs from California wild birds. *Vector-Borne and Zoonotic Diseases* 6(2):183-91.
- 3). Hom A, Bonilla D, Kjemtrup A, Kramer VL, Cahoon-Young B, Barker C, Marcus L, Glaser C, Baylis E, Jean C, Eldridge B, **Carney R**, Padgett K, Sun B, Reisen WK, Woods L, Glover J, Erickson C, Barclay C, Husted S. 2006. Surveillance for mosquito-borne encephalitis virus activity and human disease, including West Nile virus in California, 2005. *Proceedings and Papers of the MVCAC* 74:43-54.
- 2). Wheeler SS, **Carney R**, Carroll B, Wright S, Armijos V, Wilson J, Garcia S, Fang Y, Reisen WK. 2005. West Nile virus in wild birds: who lives and who dies? *Proceedings and Papers of the MVCAC* 73:32-7.
- 1). Hom A, Marcus L, Kramer VL, Cahoon B, Glaser C, Cossen C, Baylis E, Jean C, Tu EH, Eldridge BF, **Carney R**, Padgett K, Sun B, Reisen WK, Woods L, Husted S. 2005. Surveillance for mosquito-borne encephalitis virus activity and human disease, including West Nile virus in California, 2004. *Proceedings and Papers of the MVCAC* 73:66-77.

PATENTS PENDING

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1. **Carney RM**. MULTIFUNCTIONAL MELANIN-BASED METALORGANIC MATERIAL. US 63/264,374; USF 21B148. Provisional patent application filed 2021-11-22.
 2. **Carney RM**. INTEGUMENTARY SYSTEM USING ARRAYS OF MOBILE HEXAGONAL SCALES. US 63/264,556; USF 21B147. Provisional patent application filed 2021-11-24.
 3. **Carney RM**, Chellappan S, Morris P, Azam F, Rivera K, Byuiyan T. SYSTEMS AND METHODS FOR CLASSIFYING MOSQUITO LARVAE BASED ON EXTRACTED MASKS OF ANATOMICAL COMPONENTS FROM IMAGES. US 63/140,505; PCT/US22/17089; USF 20A055. International patent application filed 2022-02-18.
 4. Chellappan S, Sadow SE, **Carney RM**, Wolfram BM, Weston M. SMART MOSQUITO TRAP FOR MOSQUITO CLASSIFICATION. US 17/496,563; PCT/US2021/053995; USF 20B151US; USF 20B151WO. International patent application filed 2021-10-07.
 5. Chellappan S, Minakshi M, Bharti P, **Carney RM**. SYSTEMS AND METHODS FOR CLASSIFYING MOSQUITOES BASED ON EXTRACTED MASKS OF ANATOMICAL COMPONENTS FROM IMAGES. US 17/462,809; USF 21A015US. Full patent application filed 2021-08-31.

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SOFTWARE

1. Artificial intelligence tools for citizen scientists and mosquito control personnel to identify the species, sex, and gonotrophic stage of larval and adult mosquitoes using smartphone photos. Developed through NSF grant #2014547 and patents list above, in collaboration with Chellappan lab. Freely available at mosquitoID.org (beta launch April 2022).
2. **DYCAST**: Dynamic Continuous-Area Space-Time model for predicting mosquito-borne diseases. PI on software development projects; coding by Vincent Meijer and Alan McConchie (Python, PostGIS, SQL). (Carney 2010, Carney et al 2011 [citations above]). Project page: DYCAST.org; DYCAST 3.0 and QGIS plugin published on GitHub (2021): <https://github.com/CarneyLab>
3. **ArcOSAUR**: ArcGIS Operations for Surface Analysis Using Rasters toolkit for ArcGIS software. (Carney RM. 2008. *Journal of Vertebrate Paleontology* 28(35):61.)
4. **GooglEcology**: created corporate planning dashboard based on “organizational phylogenetics” and using Improvise software.

REVIEWER FOR

Graduate Women in Science National Fellowship Program, *International Journal of General Medicine*, NASA, *Nature*, *Naturwissenschaften*, *PLOS ONE*, SLAC National Accelerator Lab

PROFESSIONAL AFFILIATIONS

American Chemical Society, American Mosquito Control Association, International Society of Vertebrate Morphology, Sigma Xi (Full Member, 2015-present), National Geographic (Explorer, 2012-present), Society of Experimental Biology, Society for Integrative & Comparative Biology, Society of Vertebrate Paleontology (Lanzendorf PaleoArt Committee, 2012-present), Tampa Bay Fossil Club (Scientific Advisor, 2018-present), USF Anthropocene Working Group, USF Evolution Working Group, USF Paleobiology Working Group, USF Pandemic Research Response Network™ COVID-19 Research Task Force (Member of two hubs: Surveillance & Epidemiology, and Information Computing & Communications Technologies, 2020-present);

INSTITUTIONAL SERVICE (USF)

- Department of Integrative Biology: Curriculum Committee (2019-present), Seminar Committee (2019-21), Visibility & Web Page Committee (2017-19), Graduate Admission and Policy Committee (2017-19)
- University of South Florida: Office of Undergraduate Research, Faculty Advisory Committee (2017-18); Pre-Veterinary Society, Advisor (2018-present)

PROFESSIONAL EXPERIENCE

Paleontologist

8/02 – present

- Served as Principal Investigator for various international collaborative research projects, most notably: 1). high-resolution 3D digital scanning and reconstruction of the best-preserved *Archaeopteryx* skeleton, 2). investigating

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the color and composition of the isolated *Archaeopteryx* fossil feather (Carney et al 2012), and 3). investigating the coloration and exceptional soft-tissue preservation of a mummified dinosaur.

- Created a set of computational tools (ArcOSAUR: ArcGIS Operations for Surface Analysis Using Rasters) for topographical analysis of 3D anatomical data within a geographic information systems platform.
- Conducted fieldwork in the Cretaceous Hell Creek Formation of North Dakota and Jurassic Solnhofen of Germany.
- Produced and directed documentary video, photography, and press releases for future dissemination in popular media; created and licensed computer animated video content for publication and television broadcast.

Google, Mountain View, CA

6/09 - 8/09

Intern

- Created an interactive organizational planning dashboard (“GooglEcology”) for executives to easily visualize, analyze, and compare internal data. Invented a new heuristic (“organizational phylogenetics”) that integrates frameworks and methodologies from ecology, evolutionary science, and sociology.
- Validated and improved a survival analysis statistical model for predicting employee attrition, and also analyzed which elements of diversity drove innovation among engineering teams.

Yale University, Ribeirão Preto, Brazil

6/08 - 8/08

Centers for Disease Control, Graduate Fellow Intern

- Designed and conducted a research project involving the spatiotemporal analysis of dengue virus transmission in Ribeirão Preto, Brazil; created and analyzed various datasets (e.g., human dengue cases, vector surveillance, census, address locator, satellite imagery) (Carney 2010).
- Met with local health departments, vector control agency, research laboratory, and medical facility to acquire necessary data; consulted agencies on how to implement and utilize geographic information systems.

California Department of Public Health, Richmond, CA

2/04 - 8/07

Coordinator, West Nile Virus (WNV) Dead Bird Surveillance Program

- Led a 33-person, \$600K statewide disease surveillance program, including hotline and website.
- Served as Principal Investigator for two research projects (Carney et al 2008, Carney et al 2011), presented research at national and state conferences.
- Secured \$200K to create and maintain an open-source, real-time West Nile virus risk modeling system (DYCAST), which predicted 82% of human cases its first year. Success resulted in incorporation into state response plan.
- Coordinated and collaborated with >250 agencies and laboratories regarding submission and reporting of test samples (>9K/year), weekly bulletins of statewide results, and public education campaigns.
- Developed and coordinated a centralized, multi-agency database network (BIRD) for managing and disseminating all avian influenza surveillance data statewide.
- Created hotline features to accommodate a 17-fold seasonal increase in calls (up to 3K/day) and increase public education and disease prevention; created and initiated novel algorithms and solutions for emergency control during epidemics.

University of California, Berkeley, CA

7/02 - 1/04

Staff Research Associate I & II, Insect Biology: Dr. Robert Lane Lyme Disease Lab

- Conducted research in NIH and CDC-funded genetic and BL3 animal laboratories; investigated the ecology, epidemiology, and microbiology of *Borrelia burgdorferi* spirochetes and other tick-borne pathogens.
- Conducted experimental studies and procedures involving research animals and vector-borne diseases in the field and laboratory; collected and managed ticks and wildlife in field-study sites.
- Performed PCR assays of ticks, vertebrate tissues, and borrelial isolates for identification and sequence characterization; managed data and sample collections.

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SKILLS

Software: 3D modeling and animation (Maya, ZBrush), 3D processing (Geomagic, MeshLab), CT imaging and segmentation (Avizo/Amira, OsiriX/Horos), databases and queries (Access, Excel, SQL), data visualization (ImageJ, Imprime), genetic (GenBank, Sequencher), graphic design and illustration (Adobe Creative Suite), geographic information systems (ArcGIS suite/Python), MATLAB, MS Office suite, photogrammetry (PhotoScan, Reality Capture), satellite imaging (ER Mapper, ENVI), statistical (R, SAS, SPSS), video editing (Final Cut Pro, Premiere), web design/HTML.

Laboratory: acid demineralization, animal care, contrast-enhanced staining, CT scanning, DNA extraction/sequencing, electromyography, gel electrophoresis, human and animal cadaver dissection, laser scanning, light microscopy, RT-PCR, scanning electron microscopy, tissue fixation, time-of-flight secondary ion mass spectrometry (ToF-SIMS), veterinary surgery, wavelength-dispersive X-ray spectroscopy, X-ray diffraction, X-ray Reconstruction of Moving Morphology (XROMM).

SCIENCE OUTREACH

Books

- Research and art profiled in high school textbook *World of Chemistry*, 4th Edition by Zumdahl et al 2020, p.380-1 (>20,000 circulation; National Geographic Learning/Cengage)

Television

- Digital paleontology research featured on Bay News 9 (2018) [see *Press* link below for video]
- Digital Dinosaurs class featured on FOX 13 (2017, 2019): [<http://www.ryancarney.com/digitaldinosaurs>]
- National Geographic Channel. TBD film. Consultant (2016)
- National Geographic Channel. "T. rex Autopsy." Consultant (2015)
- Discovery / Science Channel. "The Dinosaur Feather Mystery." Contributor (2004)

Online

- National Geographic: selected as one of five paleontologists to be on a "Reimagining Dinosaurs" panel, given on Facebook Live to an international audience. Viewership: >140,000. (2020)
- National Geographic Learning / Cengage: two virtual "Masterclass" visits to elementary, middle, and high school students in 96 institutions across 12 countries in Latin America. Estimated viewership: 11,000 students. (2020)

Exhibits

- "Dinosaurs Take Flight: The Art of *Archaeopteryx*" traveling exhibit. Contributor, consultant (2015)
- Garden of the Gods Visitor Center. "*Theiophytalia kerri*." Consultant (2014)
- Lawrence Hall of Science. "Big Dinos Return." Contributor (2005)

Misc (see also public presentations below)

- National Geographic Emerging Explorer (2017-present; Explorer since 2012)
- Visited 2nd grade classroom at Oakridge Elementary School to teach students about dinosaurs and augmented reality [video: <http://www.ryancarney.com/outreach>] (2017)
- National Geographic Learning / Cengage. Global middle school curriculum, Flight unit. Contributor (2016)
- National Geographic Kids. "Dinosaur Color" by Zac Petit. Interviewee (2014)
- Volunteer: Florida Aquarium: National Fossil Day (2016); Yale Peabody Museum: Dr. Martin Luther King Jr. Days, Paleo-Knowledge Bowl (2007-2010); California State Capital: Science Days (2007).
- San Francisco Chronicle. "Chronicles in Education: The New Science of Dinosaurs." Contributor (2005)

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PRESS

2021

- *National Geographic Magazine*: *Archaeopteryx* research featured in the September issue's article "From a dino's wing" by Michael Greshko.
- [USF Press Release](#): "22 USF Faculty Members Recognized with Outstanding Research Achievements Awards"
- [Tampa Channel 10](#): "This app is trying to track which mosquitoes in your area may be carrying diseases"
- [USF Press Release](#): "USF researchers launch social media campaign to identify risk of mosquito-borne diseases in Tampa Bay"

2020

- **Carney et al 2020**, *Archaeopteryx* feather study: [New York Times](#), [National Geographic](#), [USF](#)
- [USF Press Release](#): "USF researchers develop new technologies to fight mosquito-borne diseases"
- TV coverage: [Tampa Channel 10](#). "USF awarded major grant to help control spread of mosquito-borne diseases"
- Comments in: <https://www.nationalgeographic.com/science/2020/08/smallest-dinosaur-known-actually-peculiar-ancient-lizard/>

2019

- *New Scientist*: "The Early Bird" by Michael Marshall. <https://www.sciencedirect.com/science/article/abs/pii/S0262407919309856>
- Comment in: <https://www.nationalgeographic.com/science/2019/06/first-blue-feathers-found-on-fossil-bird-messel-pit-rollers-paleontology/>, <https://www.nationalgeographic.com/science/article/smallest-ever-fossil-dinosaur-found-trapped-in-amber>

2018

- *National Geographic Magazine*: *Archaeopteryx* research featured in a 2-page spread in the May 2018 issue: <https://www.nationalgeographic.com/magazine/2018/05/dinosaurs-survivors-birds-fossils/>
- Bay News 9: "USF professor brings dinosaurs 'back to life'" by Katie Jones [*TV clip in link*]: <http://www.baynews9.com/fl/tampa/news/2018/05/10/usf-professor-brings-dinosaurs-back-to-life.html>
- Comment in: <https://www.nationalgeographic.com/science/2018/10/news-fossil-lungs-bird-dinosaurs-cretaceous-soft-tissue-paleontology/>

2017

- [USF News](#). "USF scientist one of 14 world-changers named 2017 National Geographic Emerging Explorers" by Tina Meketa.
- [National Geographic](#). "National Geographic Emerging Explorer Ryan Carney using X-rays and alligators to bring dinosaurs back to life" by Andrew Howley.
- [USF Magazine](#). "Using virtual reality to learn more about dinosaurs"
- [Inside Higher Ed](#). "More than just cool?" by Nick Roll.
- [The Science Times](#). "Paleontologist uses virtual reality to learn about the evolution of dinosaurs" by Zen Menahem.
- [National Geographic](#). "Fourteen world-changers named 2017 National Geographic Emerging Explorers."
- Comment in: [National Geographic](#). "How mosquitoes use stealth to steal your blood" by Elaina Zachos.

2016

- [PNAS](#). "News Feature: Prehistoric animals, in living color" by Amber Dance.
- Comment in: [Christian Science Monitor](#). "How a 10-million-year-old snake helps bring extinct animals into full color" by Eva Botkin-Kowacki.

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2015

- **Lindgren et al 2015**, *Scientific Reports* press releases: [EurekAlert!](#), [Brown University](#): “Pigments, organelles persist in fossil feathers” • articles: [Forbes](#), [IFLScience!](#), [NBC News](#), [redOrbit](#), [Science Update radio / AAAS](#), [Tech Times](#), [Vice / Motherboard](#), [Der Standard](#) (Austria), [Yahoo! News](#) (Canada), [Gazeta Wyborcza](#) (Poland), [VladTime](#) (Russia), [Europa Press](#) (Spain)
- [Providence Journal](#). “‘Nerd Nite’ debut in Providence draws a curious crowd” by Carol Kozma
- [Vice / Motherboard](#). “These Are the Dinosaurs Paleontologists Want to See in Movies” by Becky Ferreira

2014

- **Lindgren et al 2014**, *Nature* press release: [EurekAlert!](#): “Fossil pigments reveal the colors of ancient sea monsters” • articles: [BBC](#), [Brown Daily Herald](#), [Brown University](#), [CBS News](#), [Discovery News](#), [National Geographic](#), [Phys.org](#), [redOrbit](#), [Science / AAAS](#), [The Scientist](#), [Laborwelt](#) (Germany), [Spiegel Online](#) (Germany), [Le Scienze](#) (Italy)
- [Nature](#). “Rival species recast significance of ‘first bird’” by Ewen Callaway
- [National Geographic](#). “Feathered Fossils Give Scaly Dinosaurs a Makeover” by Dan Vergano
- **Carney et al 2014**, *JVP* press release: [Society for Vertebrate Paleontology](#): “Taking a deeper look at ‘ancient wing’” • articles: [Vice / Motherboard](#), [Science World Report](#), [Science 2.0.](#), [Biosphere](#)
- [LiveScience](#). “True Color of Dinosaur Feathers Debated” by Megan Gannon
- [COSMOS](#) (Australia). “The ever-changing land of the dinosaurs” by Becky Crew
- [Journal Sentinel](#). “Study finds new shades in proto-bird's feathers” by Jennifer Laaser
- [Chemistry World / Royal Society of Chemistry](#) (UK). “Colouring in the dinosaur book” by Emma Stoye

2013

- *Archaeopteryx* research featured in the book, [My Beloved Brontosaurus](#) by Brian Switek
- *Archaeopteryx* research featured in the book, [Zombie Birds, Astronaut Fish, and Other Weird Animals](#) by Becky Crew

2012

- **Carney et al 2012**, *Nature Communications* press releases: [EurekAlert!](#), [Brown University](#): “Winged dinosaur Archaeopteryx dressed for flight” • articles: [The New York Times](#), [Nature](#), [Science / AAAS](#), [National Geographic](#), [Brown Daily Herald](#), [ScienceNews](#), [Huffington Post](#), [Medill Reports](#), [WSU](#), [COSMOS](#) (Australia), [Die Presse](#) (Austria), [Futura-Sciences](#)(France), [Hindustan Times](#) (India), [NRC](#) (Netherlands), [NWT Magazine](#) (Netherlands), [Scientias](#) (Netherlands), [Kennislink](#)(Netherlands), [La Razon](#) (Spain), [metrics](#) • video: [National Geographic/Brown University](#) • radio: National Geographic Weekend Radio, [Discover Magazine](#). “*Archaeopteryx*: The Embargoed Tattoo” by Carl Zimmer
- **Vinther et al 2012**, *Palaeontology* press release: [UT Austin](#): “CT scan and 3-D print help scientists reconstruct an ancient mollusk” • articles: [National Geographic](#), [Daily Mail](#), [redOrbit](#), [Sci-News](#), [Science](#), [Space & Robots](#) • animation: [link](#)

2011

- **Carney et al 2011**, *Emerging Infectious Diseases* press release: [Brown University](#): “Software predicted virus risk in California epidemic” by David Orenstein • articles: [Medical Xpress](#), [redOrbit](#), [UPI](#)

2008

- **Carney et al 2008**, *Emerging Infectious Diseases* • article: [Yale University](#). “Aerial Spraying Effectively Reduces Incidence of West Nile Virus in Humans” by Michael Greenwood

2006

- [San Francisco Chronicle](#). “West Nile warning system: Citizens’ dead bird reports have helped control infected mosquitoes” by Sabin Russell

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- [San Francisco Chronicle](#). “West Nile could get worse, expert warns: Virus outbreak could turn into major epidemic” by Sabin Russell
- [Smash Magazine](#). “Mastema” by Lauren Napier
- [Government Health IT](#). “Surveillance case study: Mosquito coasts” by Dibya Sarkar

ORAL PRESENTATIONS

- “AI-enabled citizen surveillance for *Anopheles stephensi*.” Invited featured speaker for the Innovative Vector Control Consortium’s *Tech Bites* series. 2/18/2022.
- “Origins.” Invited featured speaker for outreach webinar to high school students at Centro Escolar del Tepeyac in Naucalpan, Mexico. 6/11/2021.
- “New digital tools for fighting mosquito-borne diseases”. Invited featured speaker for NASA's *GLOBE Mission Mosquito* webinar series. 5/13/2021. [[video](#)]
- “Digital Dinosaurs & Diseases.” Invited featured speaker for the *Frontiers in Science* public lecture series. Florida Atlantic University. Boca Raton, FL. 2/21/2020.
- “Immersive Experience.” Invited by USF to represent the College of Arts & Sciences and present my lab’s digital paleontology and epidemiology research, via PowerPoint and hands-on demos. Synapse Summit. Tampa, FL. 2/11/2020.
- “*Archaeopteryx holographica*: Bringing the Urvogel back to life with scientific animation and VR/AR.” Invited symposium speaker. Also co-led lab’s station at the associated VIRTMorph symposium workshop. International Congress of Vertebrate Morphology conference. Prague, Czech Republic. 7/23/2019.
- “Evolution of the archosaurian shoulder joint and the flight stroke of *Archaeopteryx*”. Society for Integrative & Comparative Biology annual conference. Tampa, FL. 01/05/2019.
- “*Archaeopteryx holographica*: bringing the Urvogel back to life with scientific animation and VR/AR.” Invited symposium speaker. Society of Vertebrate Paleontology annual conference. Albuquerque, NM. 10/19/2018
- “Digital Dinosaurs & Diseases: from *Archaeopteryx* to Zika.” Invited speaker. Biology Department Seminar, Southeastern Louisiana University. Hammond, LA. 9/6/2018.
- “Bringing dinosaurs back to life.” Invited speaker. Student matinees and VR/AR demonstrations. Virginia Living Museum. Newport News, VA. 5/19/2018.
- “Digital Dinosaurs.” Invited speaker. Evening presentation and VR/AR demonstration. Virginia Living Museum. Newport News, VA. 5/17/2018.
- “Digital Dinosaurs & Diseases: from *Archaeopteryx* to Zika.” Invited speaker. Taste of Science. Tampa, FL. 4/26/2018.
- “Origins.” Invited speaker. Student matinee (6th-8th graders). National Geographic Headquarters. Washington, DC. 4/20/2018.
- “On the unexpected origin of flight.” Invited speaker. National Geographic Nights evening presentation. National Geographic Headquarters. Washington, DC. 4/19/2018.
- “On the origin of flight: the ascent of maniraptora.” Invited speaker. Darwin Day event hosted by the Evolution Working Group and Institute for the Advanced Study of Culture and the Environment (IASCE), University of South Florida, Tampa, FL. 2018.
- “Digital dinosaurs & diseases.” Invited speaker. SuperFAM TechTalk hosted by the Office of the Provost & Executive Vice President. University of South Florida, Tampa, FL. 2017.
- “Digital Dinosaurs & Diseases: from *Archaeopteryx* to Zika.” Keynote speaker. Undergraduate Research Conference. University of South Florida, Tampa, FL. 2017.
- “Digital Dinosaurs.” Invited speaker. Tampa Bay Fossil Club. Tampa, FL. 2017.
- “Digital Dinosaurs & Diseases: from *Archaeopteryx* to Zika.” Invited speaker. Dean’s Advisory Council. University of South Florida, Tampa, FL. 2017.

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- “Digital Science: from *Archaeopteryx* to Zika.” Invited speaker. Emerging Explorer award presentation. National Geographic Society Explorers Festival. National Geographic Headquarters. Washington, DC. 2017. [<http://www.ryancarney.com/natgeo>]
- “*Archaeopteryx* and the evolution of flying dinosaurs.” Keynote speaker. John H. Ostrom Symposium Series. Yale University, New Haven, CT. 2017.
- “Evolution of the archosaurian shoulder joint and the flight stroke of *Archaeopteryx*.” Invited symposium speaker. Society of Vertebrate Paleontology conference, Salt Lake City, UT, 2016.
- “Swinging for the fences.” Keynote speaker. Administrators Conference on Education, Albuquerque, NM, 2016.
- “A novel joint surface approach for studying skeletal evolution and motion.” International Congress of Vertebrate Morphology, Washington, DC, 2016.
- “Diseases & Dinosaurs.” Invited speaker. National Geographic Closer Look presentation. National Geographic Headquarters. Washington, DC, 2016.
- “Evolution of the archosaurian shoulder joint and the flight stroke of *Archaeopteryx*.” PhD dissertation defense. Brown University, Providence RI, 2016.
- “The 3D *Archaeopteryx* Project.” Society for Integrative and Comparative Biology, Division of Vertebrate Morphology regional meeting, University of Massachusetts Dartmouth, North Dartmouth, MA, 2015.
- “Imagining the Prehistoric.” Invited speaker. Nerd Nite, Providence, RI, 2015.
- “*Archaeopteryx* in 4D.” Invited symposium speaker. Society of Vertebrate Paleontology conference, Berlin, 2014.
- “Imagining the Prehistoric.” Science Communication Research Social, Brown University, 2014.
- “Imagining the Prehistoric.” Invited symposium speaker. National Geographic Society Explorers Symposium. National Geographic Headquarters. Washington, D.C., 2014.
- “*Archaeopteryx* and the evolution of the archosaur shoulder.” Society for Integrative and Comparative Biology, Division of Vertebrate Morphology regional meeting, Yale University, New Haven, CT, 2013.
- “Back in black: new evidence on the color and nature of the isolated *Archaeopteryx* feather.” International Congress of Vertebrate Morphology, Barcelona, Spain, 2013.
- “Back in black: new evidence on the color and nature of the isolated *Archaeopteryx* feather.” Society for Experimental Biology annual conference, Valencia, Spain, 2013.
- “*Archaeopteryx* feather color and mummified dinosaur skin.” Invited speaker. Geology Department, Brown University, Providence, RI, 2013.
- “A biologically-based GIS model for predicting outbreaks of mosquito-borne viral diseases.” Society for Integrative and Comparative Biology Annual Meeting, San Francisco, CA, 2013.
- “Back in black: new evidence on the color, ultrastructure, and nature of the isolated *Archaeopteryx* fossil feather.” University of Rhode Island Graduate Student Conference, Kingston, RI, 2012.
- “Back in black: new evidence on the color, ultrastructure, and nature of the isolated *Archaeopteryx* fossil feather.” Invited speaker. Brown University public forum, Providence, RI, 2012.
- “Back in black: new evidence on the color, ultrastructure, and nature of the isolated *Archaeopteryx* fossil feather.” Society for Integrative and Comparative Biology annual meeting, Charleston, SC, 2012.
- “Of bugs and birds: from vector-borne disease models to the color of flying dinosaur *Archaeopteryx*.” Invited speaker. BioMed Interdisciplinary Graduate Seminar Series, Brown University, Providence, RI, 2011.
- “Black feather color in *Archaeopteryx*.” Society of Vertebrate Paleontology conference, Las Vegas, NV, 2011.
- “Of bugs and birds: from ecological disease models to the color of *Archaeopteryx*.” Ecology & Evolutionary Biology departmental seminar, Brown University, Providence, RI, 2011.
- “What I did on my summer vacation at Google / ‘Search and Employ.’” Google, Mountain View, CA, 2009.
- “GooglEcology and ROCnroll.” Google, Mountain View, CA, 2009.
- “Cretaceous Park.” Google, Mountain View, CA, 2009.
- “Dengue transmission in Ribeirão Preto.” Universidade de São Paulo; public health internship presentation, Ribeirão Preto, Brazil, 2008.
- “The 2006 California DYCAST Program.” Mosquito & Vector Control Association of California (MVCAC) annual conference, Fresno, CA, 2007.

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- “The California Dynamic Continuous-Area Space-Time (DYCAST) risk modeling system.” Invited speaker. New York City Department of Health & Mental Hygiene, New York, NY, 2006.
- “Utilizing the spatiotemporal DYCAST system to predict human West Nile virus cases in California, and to evaluate the efficacy of aerial adulticiding within Sacramento County, 2005.” Invited presentation to Centers for Disease Control and Prevention, via conference call, 2006.
- “The California Dynamic Continuous-Area Space-Time (DYCAST) risk modeling system.” Microbial Diseases Laboratory, California Department of Public Health, Richmond, CA, 2006.
- “The California Dynamic Continuous-Area Space-Time (DYCAST) risk modeling system.” Mosquito & Vector Control Association of California annual conference, Reno, NV, 2006.
- “The California Dynamic Continuous-Area Space-Time (DYCAST) risk modeling system.” Mosquito & Vector Control Association of California continuing education workshop, Alameda, CA, 2006.
- “Utilizing dead bird reports and GIS: Prospective space time analysis of West Nile virus risk areas.” ESRI Sacramento Users Group meeting, California Department of Public Health, Sacramento, CA, 2006.
- “California DYCAST Model: Prospective Space Time Analysis of West Nile Virus Risk Areas.” California Conference of Local Health Officers, Oakland, CA, 2005.
- “Arbovirus Surveillance & Response: West Nile Virus: 2004.” Vector-Borne Disease Section annual off-site meeting, Sacramento-Yolo Mosquito and Vector Control District, Elk Grove, CA, 2005.
- “Public Health Labs and the WNV Dead Bird Surveillance Program.” Public Health Laboratory Dead Bird PCR Testing workshop, University of California, Davis, CA, 2005.
- “The WNV Dead Bird Surveillance Program.” MVCAC continuing education workshop, Fresno, CA, 2005.
- “The Dead Bird Surveillance Program – Challenges and Solutions in 2004.” Mosquito & Vector Control Association of California annual conference, Monterey, CA, 2005.
- “Utilizing digital techniques within an extant phylogenetic bracketing paradigm to reconstruct and analyze the role of articular cartilaginous structures in dromaeosaur forelimb function.” Society of Vertebrate Paleontology annual conference, Denver, CO, 2004.
- “The CDHS West Nile virus Dead Bird Surveillance Program.” Mosquito & Vector Control Association of California annual steering committee meeting, Davis, CA, 2004.
- “Using digital scanning and modeling to reconstruct and test the forelimb function of *Deinonychus antirrhopus*.” Society of Vertebrate Paleontology annual conference, Minneapolis, MN, 2003.

ADDITIONAL INFORMATION

- Award-winning visual artist: drawing, painting, sculpture, and digital media; two-page spread published in *National Geographic Magazine* (May 2018), total circulation ~10 million.
- Musician (2000-7); singer/songwriter, guitarist. Toured for three summers on Warped Tour, created and managed the DIY Stage for two. Opened up for the Misfits’ 25th anniversary show, performed at the legendary punk venue 924 Gilman Street, and played live on San Francisco’s largest rock radio station 107.7 The Bone. Recorded with Grammy-award winning producer/engineer Michael Rosen, including a song for [Google](#) at Fantasy Studios.
- Actor (1999-2006); Marla Dell Talent Agency. Appeared in *E.T. the Extra-Terrestrial 20th Anniversary Edition* (2002).