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## JANE S. WATERS

### appointments

#### Providence College

Professor of Biology, 2023 – present.  
Associate Professor of Biology, 2018 – 2023.  
Assistant Professor of Biology, 2014 – 2018.

#### The Field Museum of Natural History

Visiting Scientist, 2013 – 2014.

#### Princeton University

Postdoctoral Research Associate, 2012 – 2014.

### education

#### Arizona State University

Ph.D. in Biology, 2012.

#### The University of Chicago

A.B. in Mathematics, 2005.

### peer-reviewed scientific publications

Maurizio Porfiri, Pietro De Lellis, Eighdi Aung, Santiago Meneses, Nicole Abaid, Jane S Waters, and Simon Garnier. (2024). **Reverse social contagion as a mechanism for regulating mass behaviors in highly integrated social systems.** *PNAS Nexus* 3(7), 1-7. <https://doi.org/10.1093/pnasnexus/pgae246>

Waters, J. S., Toth, J. M., and Fewell, J. H. (2022). **Scaling of ant colony interaction networks.** *Frontiers in Ecology and Evolution* 10:993627, 1-11.  
<https://www.frontiersin.org/articles/10.3389/fevo.2022.993627/full>

Waters, J. S., Keough, N., Burt, J., Eckel, J. D., Hutchinson, T., Ewanchuk, J., Rock, M., Markert, J. A., Axen, Heather, J., and Gregg, D. (2022). **Survey of ants (Hymenoptera, Formicidae) in the city of Providence (Rhode Island, United States) and a new northern-most record for *Brachyponera chinensis* (Emery, 1895).** *Check List: The Journal of Biodiversity Data* 18, 1347-1368.  
<https://checklist.pensoft.net/articles.php?id=90866>

Ko H., Komiliam K., Waters J. S., Hu, D. L. (2022). **Metabolic scaling of fire ants (*Solenopsis invicta*) engaged in collective behaviors.** *Biology Open* 11, 1-8.  
[doi:10.1242/bio.059076](https://doi.org/10.1242/bio.059076)

Chick, L. D., Waters, J. S., and Diamond, S. (2020). **Pedal to the metal: cities power evolutionary divergence by accelerating metabolic rate and locomotor performance ecology.** *Evolutionary Applications* 14, 36-52.  
<https://dx.doi.org/10.1111/eva.13083>

Lecheta, M., Awde, D., O'Leary, T., Unfried, L., Jacobs, N., Whitlock, M., McCabe, E., Powers, B., Bora, K., Waters, J., Axen, H., Fietze, S., Lockwood, B., Teets, N.,

- Cahan, S. (2020). **Integrating GWAS and Transcriptomics to Identify the Molecular Underpinnings of Thermal Stress Responses in *Drosophila melanogaster***. *Frontiers in Genetics* 11, 658.  
<https://dx.doi.org/10.3389/fgene.2020.00658>
- Hochgraf, J. S., Waters, J. S., and Socha, J. J. (2018). **Patterns of Tracheal Compression in the Thorax of the Ground Beetle, *Platynus decentis***. *The Yale Journal of Biology and Medicine* 91, 409-430.
- Waters, J. S. and McGlynn, T. P. (2018). **Natural history observations and kinematics of strobing in Australian strobe ants, *Opisthopsis haddoni* (Hymenoptera: Formicidae)**. *Myrmecological News* 27, 7-11.
- Varoudis, T., Swenson, A., Kirkton, S. D., and Waters, J. S. (2018). **Exploring nest structures of acorn dwelling ants with x-ray microtomography and surface based 3D visibility graph analysis**. *Philosophical Transactions of the Royal Society B* 373: 20170237, 1-10.
- Neville, K. E., Bosse, T. L., Klekos, M., Mills, J. F., Weicksel, S. E., Waters, J. S. and Tipping, M. (2018). **A novel ex vivo method for measuring whole brain metabolism in model systems**. *Journal of Neuroscience Methods* 296, 32-43.
- Harrison, J. F., Waters, J. S., Biddulph, T. A., Kovacevic, A., Klok, C. J. and Socha, J. J. (2017). **Developmental plasticity and stability in the tracheal networks supplying *Drosophila* flight muscle in response to rearing oxygen level**. *Journal of Insect Physiology* 106, 189-198.
- Waters, J. S., Ochs, A., Fewell, J. H. and Harrison, J. F. (2017). **Differentiating causality and correlation in allometric scaling: ant colony size drives metabolic hypometry**. *Proceedings of the Royal Society B: Biological Sciences* 284, 20162582.
- Harrison, J. F., Klok, C. J. and Waters, J. S. (2014). **Critical PO<sub>2</sub> is size-independent in insects: implications for the metabolic theory of ecology**. *Current Opinion in Insect Science* 4, 54-59.
- Waters, J. S. (2014). **Theoretical and empirical perspectives on the scaling of supply and demand in social insect colonies**. *Entomologia Experimentalis Et Applicata* 150, 99-112.
- Pinter-Wollman, N., Hobson, E., Smith, J., Edelman, A., Shizuka, D., de Silva, S., Waters, J. S., Prager, S., Sasaki, T., Wittemyer, G., Fewell, J., and McDonald, D. (2014). **Response to comments on the dynamics of network dynamics**. *Behavioral Ecology* 25(2), 260-261.
- Pinter-Wollman, N., Hobson, E. A., Smith, J. E., Edelman, A. J., Shizuka, D., de Silva, S., Waters, J. S., Prager, S. D., Sasaki, T., Wittemyer, G., et al. (2013). **The dynamics of animal social networks: analytical, conceptual, and theoretical advances**. *Behavioral Ecology* 25, 242-255.
- Waters, J. S., Lee, W. K., Westneat, M. W., and Socha, J. J. (2013). **Dynamics of tracheal compression in the horned passalus beetle**. *American Journal of Physiology – Regulatory, Integrative, and Comparative Physiology* 304, R621-R627.

- Harrison, J. F., Waters, J. S., Cease, A. J., Vandenbrooks, J. M., Callier, V., Klok, C. J., Shaffer, K. and Socha, J. J. (2013). **How locusts breathe.** *Physiology* 28, 18–27.
- Fewell, J. H., Armbruster, D., Ingraham, J., Petersen, A. and Waters, J. S. (2012). **Basketball teams as strategic networks.** *PLoS ONE* 7, e47445.
- Waters, J. S. and Fewell, J. H. (2012). **Information Processing in Social Insect Networks.** *PLoS ONE* 7, e40337.
- Waters, J. S. and Harrison, J. F. (2012). **Insect Metabolic Rates.** In *Metabolic Ecology: A Scaling Approach*, R.M. Sibly, J.H. Brown, and A. Kodric-Brown, eds. Wiley-Blackwell, pp. 198-211.
- Schilman, P. E., Waters, J. S., Harrison, J. F. and Lighton, J. R. B. (2011). **Effects of temperature on responses to anoxia and oxygen reperfusion in *Drosophila melanogaster*.** *Journal of Experimental Biology* 214, 1271–1275.
- Waters, J. S., Holbrook, C. T., Fewell, J. H. and Harrison, J.F. (2010). **Allometric scaling of metabolism, growth, and activity in whole colonies of the seed harvester ant, *Pogonomyrmex californicus*.** *The American Naturalist* 176(4), 501-510.
- Socha, J. J., Lee, W.-K., Harrison, J. F., Waters, J. S. Fezzaa, K., and Westneat, M. W. (2008). **Correlated patterns of tracheal compression and convective gas exchange in a carabid beetle.** *The Journal of Experimental Biology* 211, 3409-3420.
- Socha, J. J., Westneat, M. W., Harrison, J. F., Waters, J. S. and Lee, W. K. (2007). **Real-time phase-contrast x-ray imaging: a new technique for the study of animal form and function.** *BMC Biology* 5 (6).

#### major awards

Emergent Energetic Regulation in Dynamic Biological Networks (Understanding the Rules of Life: Emergent Networks)

- NSF Emerging Frontiers (EF), September 2022 – August 2027
- Total award (five institutions): \$2,999,187
- Providence College: \$527,310

Collaborative Research: Brain Size, Metabolism and Sociality in Ants

- NSF Integrative Organismal Systems (IOS), June 2020 – May 2023
- Total award (three institutions): \$1,459,601.00
- Providence College: \$145,852

R11 Track-2 FEC: From Genome to Phenome in a Stressful World: Epigenetic Regulatory Mechanisms Mediating Thermal Plasticity in *Drosophila*

- NSF EPSCoR Research Infrastructure, August 2018 – July 2022
- Total award (three institutions): \$4,771,722.00
- Providence College: \$632,731.00

#### grants and fellowships

Shadows of the Past and Visions of the Future: How Colonial Histories and Feminist Philosophy Manifest in the Myrmecologically Inspired Artwork of Complex Insect

Societies, Providence College School of Arts & Sciences Collaborative Interdisciplinary Research Award to V. Thomas and J. Waters, 2023.

Biological Imaging at Providence College (\$19,500), with J. DeGiorgis, from the Southern New England Educational and Charitable Foundation, 2022.

Sponsored Projects and Research Compliance Interdisciplinary Grant, “Topological Data Analysis and Interdisciplinary Network Science” (with Dr. Laura Murray, Department of Mathematics), 2021.

Arts & Sciences Summer Scholars Award, Providence College, 2016.

Grant Improvement Fund, Providence College, 2016.

Walsh Fund Travel Support, Providence College, 2014.

The James S. McDonnell Foundation Postdoctoral Fellowship Award in Complex Systems, 2012-2014.

Graduate and Professional Students Association Travel Grant, 2012.

NSF Doctoral Dissertation Improvement Grant, 2012.

Society for Integrative and Comparative Biology Grant in Aid of Research, 2011.

American Physiological Society Research Travel Award, 2010.

Graduate and Professional Students Association Research Grant, 2010.

National Science Foundation Graduate Research Fellowship, 2008-2011.

Graduate and Professional Students Association Travel Grant, 2009.

Sigma Xi Grant in Aid of Research, 2008.

grants awarded  
to research  
students

Developing a protocol to study ant-tending behaviors and energetic costs. Walsh Student Research Fellowship awarded to Riley Quirk ('26), 2025.

Testing the dominance of Arrhenius: How social behavior and environmental temperatures interact to regulate the supply and demand of energy in social groups. Walsh Student Research Fellowship awarded to Kaylee Mulligan ('25), 2024.

Aerobic scope and muscle physiology: how do metabolic rates change in response to strength training? Summer Undergraduate Research Grant awarded to Mireille Kingsley ('24), 2023.

Mapping the thermal environment and modeling its impacts on metabolic physiology. Summer Undergraduate Research Grant awarded to Lily Palumbo ('23), 2022.

How social behavior and interactions scale with group size in fruit flies. Summer Undergraduate Research Grant awarded to Leigh Paradis ('23), 2021.

How social behavior and interactions scale with group size in fruit flies. Summer Undergraduate Research Grant awarded to Leigh Paradis ('23), 2021.

The energy we use. Summer Undergraduate Research Grant awarded to Madeleine Bristow ('21), 2020.

published  
conference  
abstracts

- Ants of Rhode Island: *Myrmica rubra*. Providence College Veritas Summer Undergraduate Research Grant awarded to Jonathan Eckel ('21), 2018.
- Seed-harvesting ant colony effects on soil chemistry and plant growth rates. PC Undergraduate Research Grant awarded to Molly Andrus ('18), 2017.
- Acorn ant colony collective respiratory physiology. Walsh Student Research Fellowship awarded to Nicole Korzeniecki ('18), 2016.
- Natural history and urban ecology of the ants on campus at Providence College. PC Undergraduate Research Grant awarded to Joey Burt ('17), 2015.
- Schofield, S., Waters, J. S., Couret, J. (2023). Discontinuous ventilation patterns in nymphal *Ixodes scapularis*. Integrative and Comparative Biology 63.
- Filler, S., Patel, N., Kogut, S., Munteanu, D., Cahan, S., Waters, J. S., Fietze, S. (2023). Comparative analysis of RNA-seq library preparation protocols on thermally-stressed *D. melanogaster*. Integrative and Comparative Biology 63.
- Barden, T., Cruz, D., Filler, S., Waters, J. S. (2023). Rapid antennation by *Brachyponera chinensis* needle ants: does it pass the vibe check? Integrative and Comparative Biology 63.
- Palumbo, L., Bespalova, I., Axen, H., Waters, J. S. (2023). Biodiversity bootcamps and a vision for a regional network of community engagement. Integrative and Comparative Biology 63.
- Tamfu, P., Andries, J., Bespalova, I., Axen, H., Waters, J. S. (2023). Testing hypotheses about metabolic compensation and the ecophysiology of phenotypic plasticity. Integrative and Comparative Biology 63.
- Schofield, S., Waters, J. S., and Couret, J. (2023). Discontinuous ventilation patterns in nymphal *Ixodes scapularis*. Integrative and Comparative Biology 63.
- Perl, C.D., Coto, Z.N., Waters, J.S., Traniello, J.F.A., Harrison, J.F. (2022). Brain and body metabolic rate of the harvester ant, *Pogonomyrmex barbatus*. Integrative and Comparative Biology 62.
- Cruz, D., Andries, J., Barden, T., Vella, K., Cooper, E., Diltz, J., Olatunji, O., Tamfu, P., Tipping, M., Waters, J.S. (2022). Metabolic rates of needle ants, *Brachyponera chinensis*, from Rhode Island. Integrative and Comparative Biology 62.
- Vella, K., Paradis, L., Barden, T., Andries, J., Cooper, E., Cruz, D., Tamfu, P., Waters, J.S. (2022). Metabolic rates and behavior of fruit flies, *Drosophila melanogaster*, individually and in groups. Integrative and Comparative Biology 62.
- Coto, Z.N., Muratore, I., Fandozzi, E., Azorsa, F., Waters, J.S., Harrison, J.F., Perl, C., Kamhi, J.F., Muscedere, M., Traniello, J.F.A. (2022). Body Size, Social Complexity and Brain Metabolic Scaling in Ants. Integrative and Comparative Biology 62.
- Korzeniecki, N., and Waters, J.S. (2020). Taking the pulse of the city: measuring metabolism and counting ants with students. In symposium: Myrmecology for All: Combining Morphology, Molecules, Ecology, and Behavior to Advance Ant Systematics, Entomological Society of America.

- Awde, D.N., Lecheta, M.C., Unfried, L.N., Jacobs, N.A., Powers, B., Bora, K., Waters, J.S., Axen, H.J., Fietze, S.E., Lockwood, B.L., Cahan, S.H., and Teets, N.M. (2020) Genetic mechanisms of basal thermal tolerance in *Drosophila melanogaster*. Integrative and Comparative Biology 60.
- Cahan, S.H., Fietze, S. Gerrard, D.L., Bora, K., Kaplan, I., Perez, M. Lockwood, B.L., Teets, N.M., Waters, J.S., Axen, H.J. (2020) Developmental temperature alters brain gene expression in adult *Drosophila melanogaster*. Integrative and Comparative Biology 60.
- Ramsaran, S.K. and Waters, J.S. (2020). Heat shock physiology: measuring the metabolic impacts of thermal stress in *Drosophila melanogaster*. Integrative and Comparative Biology 60.
- Diamond, S., Chick, L., and Waters, J. S. (2019). Pedal to the metal: cities power evolutionary differentiation in acorn ants by accelerating metabolic rate while diminishing its thermal sensitivity. Evolution, T501.
- Swenson, A. S., Kirkton, S. D., and Waters, J. S. (2018). [Using X-ray Microtomography to Visualize and Quantify the Nest Architecture of Acorn Ant Colonies](#). Integrative and Comparative Biology 58.
- Waters, J. S. (2017). Insights on the fluid transport, geometric scaling, and living architecture of insect physiological systems revealed by x-ray imaging. Proceedings of the 2<sup>nd</sup> International Symposium on Image Based Metrology (ISIMet).
- Korzeniecki, N. W., Cassidy, D. P., and Waters, J. S. (2017). [Metabolic Dynamics: From Individuals to Whole Colonies](#). Integrative and Comparative Biology 57.
- Campbell, A. M., Korzeniecki, N. W., and Waters, J. S. (2017). [The Ants of Rhode Island: Species Richness and Spatiotemporal Abundance of Ants Across an Urban College Campus](#). Integrative and Comparative Biology 57.
- Higgins, D. J., Kirkton, S. D., and Waters, J. S. (2017). [The Secret Societies Living Within an Acorn: Temnothorax Ant Colonies Visualized with X-ray Microtomography](#). Integrative and Comparative Biology 57.
- Waters, J. S., Toth, J., Harrison, J. F., and Fewell, J. H. (2017). [Metabolic Allometry and the Scaling of Interaction Patterns with Ant Colony Size](#). Integrative and Comparative Biology 57.
- Fabiano, J. N., Higgins, D., Ortega, J., Precoio, L., and Waters, J. S. (2017). [The pressure is on: modeling, design, and performance of circulatory pumps in physiology](#). Integrative and Comparative Biology 57.
- Waters, J. S., Ochs, A., Toth, J., Fewell, J. H., and Harrison, J. F. (2016). Experimental manipulation demonstrates causality of colony size effects on metabolic rates of ant colonies. The FASEB Journal, 30.
- Waters, J. S. (2015). Collective behavior and the respiratory physiology of social insect colonies. The FASEB Journal, 29, LB643.
- Harrison, J.F., Waters, J. S., Holbrook, C. T., and Fewell, J. H. (2014). Scaling of energetics and division of labor in harvester ants. 17th Congress of the

- International Union for the Study of Social Insects (IUSSI), Cairns, Australia, 13-18 July 2014.
- Waters, J. S. (2014). Modeling the collective dynamics of metabolic allometry. *Integrative and Comparative Biology* 54.
- Waters, J. S., and Harrison, J. F. (2013). Metabolic and behavioral variation with colony size and age: a manipulative test of the size-dependence theory of metabolic allometry. *Integrative and Comparative Biology* 53, e223.
- Kovacevic, A., Biddulph, T., Waters, J. S., and Harrison, J. F. (2013). Effects of the larval oxygen environment on the three-dimensional branching structure of insect flight muscle tracheae. *Integrative and Comparative Biology* 53, e312.
- Biddulph, T. A., Kovacevic, S., Waters, J. S., and Harrison, J. F. (2013). Trachea and flight muscle volumes of adult *Drosophila melanogaster* reared in hypoxia, normoxia, and hyperoxia using synchrotron x-ray phase contrast microtomography. *Integrative and Comparative Biology* 53, e247.
- Harrison, J.F., Waters, J. S., Cease, A. C., VandenBrooks, J. M., Callier, V., Klok, C. J., Shaffer, K., and Socha, J. J. (2013). How hoppers breathe. *Integrative and Comparative Biology* 53, e294.
- Miller, L., Waters, J. S., Harrison, J.F., Vandenbrooks, J.M., Yager, D.D., Xiao, X., DeCarlo, F., and Socha, J.J. (2012). The use of SR- $\mu$ CT for 3D visualization of insect tracheal systems. *Integrative and Comparative Biology* 52, e295.
- Harrison, J.F., Waters, J. S., Heinrich, S.M., and Socha, J.J. (2012). Effects of rearing oxygen level on the anatomy of the adult tracheal system in *Drosophila*. *Integrative and Comparative Biology* 51 (6).
- Waters, J. S., Heinrich, S. M., and Harrison, J. F. (2011). Anatomy of the tracheole system supplying *Drosophila* flight muscle. *Integrative and Comparative Biology* 51, e264.
- Bespalova, I. and J. S. Waters. (2011). Variable success of two colony founding strategies: A case study using the California seed-harvester ant. *Integrative and Comparative Biology* 51, e165.
- Waters, J. S., Fewell, J. H., and Harrison, J. F. (2011). Metabolic and behavioral integration in social insect colonies. *Integrative and Comparative Biology* 51, e146.
- Fewell, J. H. and Waters, J. S. (2010). Social insect networks are not “social networks.” Annual meeting of the Animal Behavior Society, Williamsburg, VA.
- Waters, J. S. and Harrison, J. F. (2010). Geometric characterization and phenotypic plasticity in tracheal networks supplying insect flight muscle. *Integrative and Comparative Biology* 50, e186.
- Waters, J. S., Holbrook, C. T., Fewell, J. H., and Harrison, J. F. (2009). Allometric scaling of whole colony metabolic rate in *Pogonomyrmex californicus*. *Integrative and Comparative Biology* 49, e179.
- Lee, W. K., Socha, J. J., Westneat, M. W., Harrison, J. F., and Waters, J. S. (2007). Direct visualization of internal respiratory and food transport dynamics in insects. *Bulletin of the American Physical Society* (52).

Westneat, M. W., Socha, J. J., Waters, J. S., Hale, M. E., and Lee, W-K. (2006). The expiration data is today: Diversity of convective insect respiratory behavior visualized by synchrotron x-ray imaging. *Integrative and Comparative Biology* 46, e265.

Socha, J. J., Waters, J.S., Westneat, M. W., LaBarbera, M., Cook, S., Fezzaa, K., and Lee, W-K. (2006). The Poise that refreshes: dynamics of internal food transport in a butterfly. *Integrative and Comparative Biology* 46, e133.

Hale, M. E., Waters, J. S., Lee, W-K, Socha, J. J., Fezzaa, K., and Westneat, M. W. (2006). Drawing inspiration from insect breathing and heaving conventional wisdom: Convective tracheal and air sac mechanisms in *Drosophila* visualized with x-ray imaging. *Integrative and Comparative Biology* 46, e53.

Waters, J. S. and Socha, J. J. (2005). Mechanics of tracheal compression in the bessbug, *Popilius disjunctus*. *Integrative and Comparative Biology* 45(6): 1209.

Socha, J. J., Fezzaa, K., Lee, W-K., Waters, J. S., and Westneat, M. W. (2004). Tracheal compression patterns involved in gas exchange in the ground beetle, *Platynus decentis*. *Integrative and Comparative Biology* 44(6): 748.

guest lectures  
and invited  
seminars

Invited research seminar: “**Metabolic rates, natural history, and collective behavior of ants from Rhode Island to Palestine**” delivered at:

UMass Boston, April 2024.

Clark University, October 2024.

Cornell University, January 2025.

The American Museum of Natural History, May 2025.

Data analysis, visualization, and modeling: Top 10 ways to win with R. University of Vermont REU workshop, Summer 2021.

Ants of Providence. Bridgewater State University Biology Seminar, Spring 2020.

The physiological ecology of the ants: metabolic scaling, collective behavior, and natural history. Ecology and Evolutionary Biology, Brown University, Fall 2017.

The physiological ecology of the ants: metabolic scaling, collective behavior, and natural history. Department of Biology, The University of Vermont, Fall 2017.

The Ants of Rhode Island. Rhode Island Natural History Survey, University of Rhode Island, Spring 2017.

Insect respiratory physiology: from tracheal systems to brain metabolism. Traniello Lab, Boston University, Fall 2016.

Cardiovascular system: Blood & Hematology. Physiology (BIO 405), Providence College, Spring 2016.

Interaction networks and the emergence of complexity. Graph Theory (MTH 331), Providence College, Spring 2015.

Emergence of complexity in the respiratory physiology of ant colonies. Social Insects in the Northeast Regions, Boston University, Fall 2015.



Collective behavior in social insect colonies. *Animal Behavior* (BIO 350), Providence College, Fall 2014.

Social behavior in the ants: power, identity, and resistance. *Animal Behavior* (56-1420), Columbia College, Spring 2014.

The fire of life: metabolic allometry in social insect colonies. The Field Museum of Natural History, A. Watson Armour III Research Seminar Series, Spring 2014.

The fire of life, metabolic scaling, and the search for universal laws in biology. Sarah Lawrence College Science Seminar Series, Fall 2013.

Complexity in ant colonies: Emergence of energetic scaling, respiratory synchrony, and dynamic living structures. NSF Physics of Living Systems Research Network Symposium, Princeton, NJ, Fall 2013.

Ant colony metabolic networks: insights from respiratory physiology and collective behavior. Harvard University, Concord Field Station Seminar, Fall 2013.

Metabolic and behavioral integration in social insect colonies. The University of Würzburg, Behavioral Physiology & Sociobiology Seminar, Summer 2013.

The metabolic ecology of social insect colonies. Princeton University, Theoretical Ecology Lab Tea, Spring 2013.

Comparative biomechanics: the biology of structure and function. Biologically Inspired Design (DSC 598), Arizona State University, Spring 2012.

#### media & press

“Was Bridgewater man stung by invasive Asian needle ant? What an entomologist thinks” by Chris Helms. *The Enterprise Newspaper* (Brockton, MA), August 8, 2025. <https://www.enterpriseneews.com/story/news/environment/2025/08/08/asian-needle-ant-bridgewater-massachusetts-sting-how-dangerous-resident-sick-misidentification/85278652007/>

“Asian needle ants are going viral for their nasty sting. Meet the colony that lives in Providence” by Alex Kuffner. *The Providence Journal* (Providence, RI), July 25, 2025. <https://archive.is/wIAMx>

Those flying ants in Boston are lovers, not fighters (2024). <https://www.wbur.org/news/2024/08/22/ant-swarm-boston-mating-nuptial-flights>

Bioblitz participants search for plants and animals (2022). <https://www.providencejournal.com/picture-gallery/news/2022/06/17/bristol-ri-bioblitz-marathon-science/7653269001/>

A Team from PC is Tracking RI’s Ant Population, Rhode Island Monthly (2020). <https://www.rimonthly.com/a-team-from-pc-is-tracking-ris-ant-population/>

College Professor Documenting R.I.’s Ant Biodiversity, Eco RI News (2017). <https://www.ecori.org/natural-resources/2017/5/18/providence-college-professor-documenting-rhode-islands-ant-biodiversity>

Student researchers discover the secrets of ant colony behavior (2017). <https://news.providence.edu/student-researchers-discover-secrets-ant-colony-behavior>

Stranger than fiction: These ants look like the dragons in 'Game of Thrones' (2016).  
<https://www.csmonitor.com/Science/2016/0727/Stranger-than-fiction-These-ants-look-like-the-dragons-in-Game-of-Thrones>

A view from Providence: Synagogue is a mirror of Jewish history, Providence Journal (2015). <http://www.providencejournal.com/article/20150725/NEWS/150729492>

Scott Turner: Wasps summer under sandy sidewalk, Providence Journal (2015).  
<http://www.providencejournal.com/article/20150801/OPINION/150809894>

Research featured in BBC's "Insect Dissection: How Insects Work" (2013).  
<http://www.bbc.co.uk/programmes/p00zst23>

Featured in "Local Research, Global Impact" video produced by ASU (2012).  
<http://vimeo.com/user1763763/videos>

Compound Eye (Scientific American Blog): "Waters' iPhone Ants" (2011).  
<http://blogs.scientificamerican.com/compound-eye/>

Outside JEB: "Ant colonies obey 3/4 power 'law' of metabolic scaling" (2010).  
<http://jeb.biologists.org/cgi/content/full/214/1/v-a>

ASU News: "Social evolution regulates the fire of life" (2010).  
[http://asunews.asu.edu/20100825\\_energyants](http://asunews.asu.edu/20100825_energyants)

Myrmecos.net: "More support for the superorganism concept" (2010).  
<http://myrmecos.net/2010/08/27/more-support-for-the-superorganism-concept/>

American Physiological Society: "Ant colonies shed light on metabolism" (2010).  
<http://www.the-aps.org/press/releases/10/25.htm>

Life Lines: "Ant colonies & metabolic scaling, Parts I & II (2010).  
[http://scienceblogs.com/lifelines/2010/12/ant\\_colonies\\_metabolic\\_scaling.php](http://scienceblogs.com/lifelines/2010/12/ant_colonies_metabolic_scaling.php)

published essays  
& commentary

Memories of a spiritual ecology (Motif magazine, September 10, 2025).  
<https://motifri.com/ants-in-the-city-memories-of-a-spiritual-ecology/>

Ants in the City: More important now than ever (Motif magazine, August 27, 2025).  
<https://motifri.com/ants-in-the-city-more-important-now-than-ever/>

Who showed up for Moth Week? (Motif magazine, August 13, 2025).  
<https://motifri.com/ants-in-the-city-who-showed-up-for-moth-week/>

Assemblage of joy (Motif magazine, July 9, 2025). <https://motifri.com/ants-in-the-city-assemblage-of-joy/>

Slay queen(s)! (Motif magazine, March 12, 2025). <https://motifri.com/ants-in-the-city-slay-queens/>

Taking the pulse of the city (Motif magazine, February 26, 2025).  
<https://motifri.com/ants-in-the-city-taking-the-pulse-of-the-city/>

Queer ecologies on Huxley Ave (Motif magazine, February 12, 2025).  
<https://motifri.com/ants-in-the-city-queer-ecologies-on-huxley-ave-are-checking-the-vibe/>

Shelter as a right, not a privilege (Motif magazine, January 29, 2025).  
<https://motifri.com/ants-in-the-city-shelter-as-a-right-not-a-privilege/>

Go to the ants, learn her ways, and be wise... maybe (Motif magazine, December 18, 2024). <https://motifri.com/ants-in-the-city-go-to-the-ants-learn-her-ways-and-be-wise-maybe/>

Found and chosen families, too (Motif magazine, December 4, 2024).  
<https://motifri.com/ants-in-the-city-found-and-chosen-families-too/>

Give me your tired, your poor, your huddled masses (Motif magazine, November 18, 2024). <https://motifri.com/ants-in-the-city-give-me-your-tired-your-poor-your-huddled-masses/>

Socialist ants and invert-ed hierarchies (Motif magazine, October 30, 2024).  
<https://motifri.com/ants-in-the-city-socialist-ants-and-invert-ed-hierarchies/>

The struggle for a free Palestine (Motif magazine, October 9th, 2024).  
<https://motifri.com/the-struggle-for-a-free-palestine-how-animals-play-a-pivotal-role-in-dehumanizing-rhetoric/>

Swarms and Sex (Motif magazine, September 11, 2024). <https://motifri.com/ants-in-the-city-swarms-and-sex/>

Ants in the City: Looking down to see what's up (Motif magazine, August 28, 2024).  
<https://motifri.com/ants-in-the-city-looking-down-to-see-whats-up/>

#### scientific photography

Two photographs on exhibit at the New York Hall of Science (NYSCI), 2017.

Three photographs selected for Art of Science exhibit, Princeton University, 2014.

Photograph of *Temnothorax rugatulus* colony featured in TED talk, 2017.

*Pogonomyrmex californicus* photo featured on the cover of *Geology*, 2014.

*Temnothorax* photograph published in *Nature* 500(7461): p. 125, 2013.

American Microscopical Society Photomicrography contest, 3<sup>rd</sup> place, 2013.

*Temnothorax rugatulus* photos for *Current Biology*, 2012.

*Drosophila* photomontage cover for *The Royal Society*, 2010.

*Insectes* magazine article on recent developments in *Drosophila* research, 2010.

*Drosophila* illustration in the *Encyclopedia of Behavioral Neuroscience*, 2009.

*Drosophila* photo for *Neurotoxicology and Teratology* 32(1): p. 75, 2009.

Brochure for the *Max Planck Institute for Biophysical Chemistry*, 2009.

*Pheidole* micrograph for *School of Life Sciences Magazine* (4)1: p.30, 2008.

#### open-access materials, software and data repository

How to Support Trans Colleagues (2025). Jane Waters, Rin Krichilsky, and Kanako Shimizu. [https://linktr.ee/trans\\_inclusion](https://linktr.ee/trans_inclusion)

Larsen, M. L., Simonis, J. L., and Waters, J. S. (2020). waterslab/mavenR v1.0 (v1.0). Zenodo. <https://doi.org/10.5281/zenodo.3861869>.

Waters, J. S. (2013). Horned Passalus Tracheal Compression (first leg). figshare. <http://dx.doi.org/10.6084/m9.figshare.693019>

Waters, J. S. (2013). Collapse and reinflation of a main thoracic tracheal tube. figshare. <http://dx.doi.org/10.6084/m9.figshare.693020>

Waters, J. S. (2013). Horned Passalus Tracheal Compression (prothorax). figshare. <http://dx.doi.org/10.6084/m9.figshare.693018>

Waters J. S., Holbrook C. T., Fewell J. H., Harrison J. F. (2010) Data from: Allometric scaling of metabolism, growth, and activity in whole colonies of the seed harvester ant, *Pogonomyrmex californicus*. Dryad Digital Repository. doi:10.5061/dryad.1594

#### honors

Finalist for the Accinno Teaching Award at Providence College, Spring 2023.  
 Finalist for the Accinno Teaching Award at Providence College, Spring 2021.  
 Award for Best Presentation, Second Prize, 2<sup>nd</sup> International Symposium on Image Based Metrology (ISIMet), 2017.  
 George C. Eickwort Student Research Award Honorary Mention, 2012.  
 First Place Presentation, Arizona Imaging and Microanalysis Society, 2007.  
 Nominated for GPSA Teaching Excellence Award, 2006.  
 Sigma Xi Science Prize, The University of Chicago, 2005.  
 President's Award, Chicago Area Undergraduate Research Symposium, 2005.  
 University of Chicago Merit Scholarship, 2001.

#### thesis committee service

Samantha Schofield (The University of Rhode Island, Biological and Environmental Sciences), "Intrapopulation variation in the behavior and physiology of nymphal *Ixodes scapularis*, and potential impacts of association with *Borrelia burgdorferi* sensu stricto."  
 Successful Ph. D. defense: July 28, 2025.

Etti Cooper (Bates College, Biology), "Critical Thermal Maxima and Plasticity in Metabolic Rates: A Comparison of Two Ant Species."  
 Honors thesis defended: April 15, 2022.

#### college committee appointments

Intellectual Property Committee, 2017 – 2025.  
 Diversity, Equity, and Inclusion Committee (Faculty Senate), 2024 – 2025.  
 Faculty Status Committee (Faculty Senate), 2018 – 2024.  
 Strategic Web Governance Committee, 2017 – 2021.  
 Jewish-Catholic Theological Exchange Committee, 2016 – 2021.  
 College Archives and Special Collections Committee, 2015 – 2018.

#### department service

Biology department representative in the Faculty Senate, 2018 – present.  
 Department of Biology, Organismal anatomy faculty search committee, 2022.  
 Department of Biology, Neuroscience faculty search committee, 2021.  
 Major/minor fair department representative, 2021.  
 Department secretary, 2019 – 2020.  
 Managing department social media account (@friarbiology), 2016 – 2020.

	<p>Editing department website, 2015 – 2021.</p> <p>Biology major and Neuroscience certificate student advising, 2014 – present.</p> <p>Meeting with trustee John Killian, advocating for department priorities, 2017.</p> <p>Meeting with Art &amp; Science Group for assessment feedback, 2016.</p> <p>Biology fill-in representative for department chairs meeting, 2015.</p> <p>Meeting with trustee Peter Benzie, 2015.</p> <p>Major/minor fair department representative, 2014.</p>
college service	<p>Sigma Xi Scientific Research Honor Society Faculty Advisor, 2022 – present.</p> <p>Department of Health Sciences faculty search committee, 2022.</p> <p>Faculty Status committee chair, 2021 – 2022.</p> <p>Neuroscience Certificate Program advising and member, 2014 – present.</p> <p>Academic advising for undeclared students, 2016 – 2018.</p> <p>Providence College Learning Circles participant, 2015 – 2016.</p> <p>PC Alumni Reunion Weekend presentation on The World of The Ants, 2017.</p> <p>A Day in Friartown: Coffee with Professors, 2015.</p> <p>Freshman Common Reading Program discussion leader, 2014.</p>
discipline service	<p>Maintaining a public <a href="#">worldwide map of social insect research labs</a>, 2013 - present.</p> <p>External evaluator for tenure and promotion review, 2022.</p> <p>Marsden Fund (New Zealand), proposal review, 2022.</p> <p>SICB PUI working group, 2021 – present.</p> <p>Proposal review, NSF CAREER, 2020.</p> <p>External evaluator for tenure and promotion review, 2020.</p> <p>Organized a regional meeting for ant researchers in Rhode Island, 2017.</p> <p>Division of Invertebrate Zoology (SICB) presentation judge, 2014, 2017, 2022.</p> <p>Social Insects in the Northeast Regions meeting organizer, 2012-2015.</p> <p>Journal peer-review (see below), 2010 – present.</p>
community service and outreach	<p>Emergency warming shelter volunteer, 2024 – present.</p> <p>Food Not Bombs, Providence, 2024 – present.</p> <p>Board member, The Rhode Island Natural History Survey, 2021 – 2023.</p> <p>Founding board member, The Rhode Island Jewish Museum, 2017 – 2021.</p> <p>Board member, The Rhode Island Jewish Historical Association, 2017 – 2019.</p> <p>Serve Rhode Island snow-shoveling volunteer, 2014 – 2016.</p> <p>Ant day, Charlotte Dunning Elementary School, Marlborough, MA, 2016.</p> <p>The University of Chicago Alumni Schools Committee, Rhode Island, 2014-2015.</p> <p>The University of Chicago Alumni Schools Committee, Central New Jersey, 2013.</p> <p>Organizing graduate student workshop on programming in R, 2013.</p> <p>Writing for Ask a Biologist website, <a href="http://askabiologist.asu.edu/">http://askabiologist.asu.edu/</a>, 2012.</p> <p>Bug Theater: Return of the Hexapods, Cave Creek Regional Park, 2012.</p> <p>Summer “Bug Theater” event at Estrella Mountain Regional Park, 2010.</p> <p>Physiology exhibit at Social Insect Science Expo at Desert Botanical Garden, 2010.</p> <p>Mentoring workshop on preparing graduate fellowship applications, 2009.</p> <p>Leading interdisciplinary Comparative Biomechanics reading group, 2009.</p> <p>Webmaster for A.S.U. Graduates in Earth, Life, and Social Sciences, 2009.</p> <p>Reviewing grants for Graduate and Professional Students Association, 2008.</p> <p>Web-publishing workshop for Women in Science and Engineering, 2007.</p>

	Organized the annual meeting of the Chicago Area Undergraduate Research Symposium, 2006.
membership in scientific societies	American Physiological Society Cambridge Entomological Club Entomological Society of America American Society of Naturalists Arizona Imaging and Microanalysis Society International Union for the Study of Social Insects Rhode Island Natural History Survey Society for Integrative and Comparative Biology Sigma Xi
journals served as manuscript reviewer	<i>Acta Oecologica</i> <i>The American Naturalist</i> <i>Animal Behavior</i> <i>Behavioral Ecology and Sociobiology</i> <i>Biology Letters</i> <i>Canadian Entomologist</i> <i>Current Opinion in Insect Science</i> <i>Current Zoology</i> <i>Integrative and Comparative Biology</i> <i>Ecological Entomology</i> <i>Entomologia Experimentalis et Applicata</i> <i>Evolution</i> <i>Evolutionary Ecology</i> <i>Evolution Letters</i> <i>Functional Ecology</i> <i>Insectes</i> <i>Insectes Sociaux</i> <i>Integrative and Comparative Biology</i> <i>Journal of Animal Ecology</i> <i>Journal of Experimental Biology</i> <i>Journal of Insect Physiology</i> <i>Journal of the Royal Society Interface</i> <i>Journal of Visualized Experiments</i> <i>Myrmecological News</i> <i>Nature Communications</i> <i>Physiological Entomology</i> <i>PLoS One</i> <i>PLoS Computational Biology</i> <i>Proceedings of the National Academy of Science USA</i> <i>Proceedings of the Royal Society B: Biological Sciences</i> <i>Revista Brasileira de Entomologia</i> <i>Royal Society Open Science</i> <i>Scientific Reports</i>
book peer review	Princeton University Press, 2022.

Wiley-Blackwell, 2012.  
Oxford University Press, 2012.

research profiles

Google Scholar

<http://scholar.google.com/citations?user=hKSvttMAAAAJ>

ORCID

<http://orcid.org/0000-0001-7077-9441>

ResearchGate

<https://www.researchgate.net/profile/Jane-Waters-4>

citation metrics

Citations: 1,708

h-index: 17



For the ants, love, and peace.

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J. S. W.