MICHAEL E. DILLON

Professor and L. Floyd Clarke Chair in Physiological Ecology
Department of Zoology and Physiology and Program in Ecology
University of Wyoming
1000 E. University Ave. Dept. 3166
Laramie, WY 82071-3166 USA

(307) 314-9833
Michael.Dillon@uwyo.edu
http://dillonlab.org

Education and Academic Positions

2025—	Editorial Board, Journal of Insect Physiology
2024—	Director, WyldTech Center for Wildlife, Computing, and Technology
2022—2024	Interim Director, UW-NPS Research Station
2022—	L. Floyd Clarke Chair, Dept. of Zoology and Physiology, UW
2022—	Associate Editor, Frontiers in Bee Science
2021—	Professor, Dept. of Zoology and Physiology, UW
2018—2019	Visiting professor, IRBI, Univ. of Tours, France
2019—	Editorial Board, Insects
2017—2022	Editorial Board, Integrative and Comparative Biology
2016—2020	Director, UW-NPS Research Station in Grand Teton National Park
2015—2021	Associate Professor, Dept. of Zoology and Physiology, UW
2009—	Faculty, Program in Ecology, UW
2009—2015	Assistant Professor, Dept. of Zoology and Physiology, UW
2007—2009	NSF Postdoctoral Fellow, Dept. of Integrative Biology, UC Berkeley
2005—2007	Postdoctoral Fellow, University of Washington
2005	PhD., Biology, University of Washington, Seattle, WA
1998	B.S. with high honors, Zoology, University of Texas, Austin, TX

Research Grants (since 2010)

over $11 million USD in grant funding since 2010

2025-2027 (pending). The plight of neotropical bees: preserving pollination services in changing climates. Fulbright U.S. scholar program, Colombia exchange. ~$15,000.

2024-2025 (pending). Real-time soundscape monitoring and noise mitigation for natural habitats using AI. Bezos Earth Fund AI for Climate and Nature Grand Challenge Phase 1. Jian Gong, PI. $50,000

2025-2030 (pending). CAREER: Individual variation under global change: Evaluating the role of behavioral variation for ecological resilience in social insects. NSF CAREER, James Crall, UW Madison, PI. Subaward to University of Wyoming. $131,613

2024- 2027 (pending). NSF-DBI: Mapping the Metabolic Landscape: Spatiotemporal Metabolomics of Root Exudates and Bumble Bees through Imaging-Mass Spectrometry (co-PI). PI: F. Basile. $2,340,551.

2024-2027. WyldTech Center. Technological and computing innovations for wildlife ecology and conservation. PI with co-PIs M. Kauffman, K. Monteith, S. Muknahallipatna, M. Murphy, D. Taylor, D. Yang. UW REDD Center grant, $615,837.

2023-2024. ENERGYE: Ecological Networks and Ecosystem Resilience in the Greater Yellowstone Ecosystem. Co-PI with C. Tarwater, J.P. Kelley, A. Chalfoun, D. Laughlin. UW Research Excellence Fund Seed Grant. $40,000

2023-2027. Collaborative Research: Insults for free: the roles of metamorphosis and dormancy in aging dynamics. Collaborative grant with J. Bowsher, K. Greenlee, B. Heidinger, and Joe Reinhart, NDSU. NSF IOS-IEP: $1,247,869 total, $398,251 to UW.

2023-2024. Community-based, use-inspired research solutions to environmental challenges across iconic locations of biodiversity concern. Senior personnel with PIs B. Ewers (UW) and T. Hale (CU). UW-Cardiff Seed grant fund. $22,250.

2023-2024. Quantifying organism responses to shifting thermal and hygric landscapes. Collaborative grant with Tom Bishop, Cardiff University. UW-Cardiff Seed grant fund. $15,853 total, $7749 to MED.

2022-2026. Collaborative Research: Digitization TCN: iDigBees Network, Towards Complete Digitization of US Bee Collections to Promote Ecological and Evolutionary Research in a Keystone Clade. CoPi with 29 institutions. $3,694,730 total, $25,009 to UW.

2022. Enhancing the laboratory experience in Comparative Physiology. UW Central Student Fee Committee. $26,123.

2022-2023. The influence of season and climate on montane bumble bee physiology and abundance. With E.C. Keaveny. UW-NPS Research Station Pilot Grant. $5,000.

2019-2023. NSF EF UroL: Epigenetics 2: Collaborative Research: Bumble bee cold tolerance across elevations – From epigenotype to phenotype across space, time, and levels of biological organization. Collaborative grant with J. Lozier, Univ. of Alabama. $2,491,946 total, $1,170,992 to UW.

2018-2022. NSF EPSCoR: RII Track-2 FEC: Insect Cryobiology and Ecophysiology (ICE) Network: integrating genomics, physiology, and modeling. Collaborative grant with NDSU, NMSU, and UW. UW PI: Michael Dillon. $5,710,970 total, $2,327,353 to UW.

2015-2018. NSF DEB-1457659: "Collaborative Research: Adaptation across Latitude and Altitude: Genomics, Morphology, and Physiology of Montane Bumble Bees." Collaborative grant with J. Lozier and J.P. Strange ($1,018,815 total, $436,239 to UW).

2016-2018. BLM, WLCI, UW BI: "Status of ESA-petitioned bumble bees (*Bombus occidentalis* and *Bombus terricola*) in Wyoming". CoPI with L. Tronstad. ($91,000 total).

2016-2018. BLM: "Field guide to the native bees of Wyoming." Co-PI: L. Tronstad. ($7,500).

2016-2017. European Society for Evolutionary Biology Outreach Initiative: "Flight of the bumblebee: an interactive video game exhibit to illustrate evolutionary principles from genome to phenome. Co-PI with J. Lozier ($1000).

2016-2017. UW-NPS Research Grant: "Have shifts in flowering phenology left bumblebees with inadequate forage?" Co-PI with J.D.H. Sprayberry ($5,000).

2015-2016. Company of Biologists Symposium Grant: "Beyond the mean: biological impacts of changing patterns of temperature variation." CoPIs: H.A. Woods and M.W. Sears ($2947).

2015-2016. NSF IOS-1545787 : "Beyond the mean: biological impacts of changing patterns of temperature variation." Co-PI with H.A. Woods and M.W. Sears ($15,475).

2012—2015. BLM Challenge Cost Share: "Baseline research for long-term effects of wind farms on invertebrates in Wyoming." Co-PI with LM Tronstad and A. Pilmanis ($34,416).

2012—2015. BLM Renewable Energy Coordination Office: "Baseline research for long-term effects of wind farms on invertebrates in Wyoming.". Co-PI with LM Tronstad ($90,000).

2014. UW Environmental Arts and Humanities Pilot Grant: "Moving Science: Motif analysis to reveal sub-lethal effects of pesticides." with Rachael Shaw ($1,000).

2013—2014. UW Faculty Grant in Aid of Research: "Biomechanics of the grasshopper leg". Co-

PI with C.S. Han ($7,500).

2012. Wyoming NASA Space Grant Faculty Research Initiation Grant: "Over-wintering physiology of bumblebees in changing climates." ($10,000).

2012. UW-NPS Research Grant: "Seasonal and altitudinal variation in fatty acid composition of native bees." ($5,000).

2012. NSF Mathematical Biology conference grant: "RMMC 2012: Mathematical modeling in ecology and epidemiology". Co-PI wth R. Liu, A.D. Porter ($25,000).

2012. IMA Summer Program Grant and matching grants: "RMMC 2012: Mathematical modeling in ecology and epidemiology". Co-PI wth R. Liu, A.D. Porter ($15,500).

2011. UW-NPS Research Grant: "Altitudinal body size clines in insects: patterns and mechanisms." ($5,000).

2011. BLM: "Baseline research for long-term effects of wind farms on invertebrates in Wyoming." Co-PI with L. Tronstad. ($45,000)

2010—2014. UW Agricultural Experiment Station Grant: "Long-term changes in native bee diversity, abundance, and phenology". CoPIs: C. Martinez del Rio and S.R. Shaw ($57,787).

2010. University of Wyoming International Travel Grant: "Behavioral ecology of insect thermotaxis". ($2,000).

Honors and Awards (since 2010)

2024. Graduate student invited keynote speaker, Center for Ecology and the Environment, University of Wisconsin, Madison; Invited symposium speaker Entomological Society Pacific Branch

2023. Invited participant, Science Initiative Center Ideation Event; University of Wyoming Presidential Scholarly Award; Invited Plenary speaker, Fifth workshop of Ecological and Behavioral Physiology, Mar del Plata, Argentina; Invited symposium speaker, Entomological Society of America

2019. UW Faculty Senate Speaker Series Award

2018. Honorary Coach for UW Wrestling

2015. UW A&S Extraordinary Merit in Research Award

2014. Denver University Marsico Visiting Scholar

2013. UW Mortar Board Top Prof selection (2)

2010. UW College of Arts and Sciences Student Council Thumbs-up Teaching Award

Publications

4498 citations, h-index: 30, i10-index: 41, scholar

[UG] Undergraduate student, [G] Graduate student

2025

61. Waybright, S.W.[G] and M.E. Dillon. Soilscapes of mortality risk suggest a Goldilocks effect for overwintering ectotherms. *American Naturalist.* doi: 10.1086/733183

2024

60. Tronstad, L., Bell. C.[G], Cook, K., and M.E. Dillon. Using species distribution models to assess the status of the declining Western Bumble Bee (Hymenoptera: Apidae: *Bombus occidentalis*). *Environments* 12(1), 2; doi: 10.3390/environments12010002.

59. Singh, P.[G], Rajamohan, A., Waybright, S.A.[G], Dillon, M.E., Ferrenberg, S.M., Rinehart, J.P., Bowsher, J. H. Diapause, pollen ball incidence, and overwintering energetics in the

alfalfa leafcutting bee, *Megachile rotundata*. *Frontiers in Bee Science 2-2024*. doi: 10.3389/frbee.2024.1454790

58. Verble, K[G] , Keaveny, EC[G] , Rahman, S., Jenny, M., Dillon, M.E., and J.D. Lozier. A rapid return to normal; temporal patterns of gene expression following cold exposure in the bumble bee *Bombus impatiens*. *J. Exp Bio.* 227(9):jeb247040. doi: 10.1242/jeb.247040

2023

57. Keaveny, E.C.[G] , Helling, M.R., Basile, F, Strange, JP, Lozier, JD, and M.E. Dillon. Metabolomes of bumble bees reared in common garden conditions suggest constitutive differences in energy and toxin metabolism across populations. *J of Insect Physiology* 151:104581. doi: 10.1016/j.jinsphys.2023.104581

56. White, S.W.[G] and M.E. Dillon. Climate warming and bumble bee declines: the need to consider sub-lethal heat, carry-over effects, and colony compensation. *Frontiers in Physiology* 14:1251235. doi: 10.3389/fphys.2023.1251235.

55. Christman, M, Barkan, N, Campion, C.C.[G], Heraghty, S[G], Keaveny, E.C.[G], Verble, K.[G], Waybright, S.W.[G], Dillon, M.E., Lozier, J.D., Strange, J.P. It's buzziness time: rearing, mating, and overwintering *Bombus vosnesenskii* Radoszkowski (Hymenoptera: Apidae). *J. Insect Science* 23(5):18. doi:10.1093/jisesa/iead089

54. Barrile, G.M., Bernard, R.F., Wilcox, R.C., Becker, J.A., Dillon, M.E., Thomas-Kuzilik, R.R., Bombaci, S.P., and B.G. Merkle. Equity, community, and accountability: leveraging a department-level climate survey as a tool for action. *PLOS One* 18(8): e0290065. doi: 10.1371/journal.pone.0290065

53. Buckley, L.B., Carrington, E., Dillon, M.E., Garcia-Robledo, C., Roberts, S.B., Wegrzyn, J.L., and M.C. Urban. Characterizing biological responses to climate variability and extremes to improve biodiversity projections. *PloS Climate* 2(6): e0000226. doi: 10.1371/journal.pclm.0000226.

52. Campion, C.[G] , Rajamohan, A., and M.E. Dillon. Sperm can't take the heat: short-term temperature exposures compromise fertility of male bumble bees (*Bombus impatiens*). *J. Insect Physiology* 146: 104491. doi: 10.1016/j.jinsphys.2023.104491

51. Johnson, M.G.[G] , Glass, J.R.[G] , Dillon, M.E., and J.F. Harrison. How will climate warming affect insect pollinators? *Advances in Insect Physiology* 64: 1-115. doi: 10.1016/bs.aiip.2023.01.001

50. Crawford, M.S.[UG], Dority, D.[G], Dillon, M.E., and L. Tronstad. Insects are attracted to white wind turbine bases: evidence from turbine mimics. *Western North American Naturalist* 83 (2): 232-242, 8.

49. Harvey, Jeffrey, … Dillon, M.E., … et al (70 authors). Scientists' warning on climate change and insects. *Ecological Monographs*. e1553. doi: doi.org/10.1002/ecm.1553

2022

48. Keaveny, E.C.[G] and M.E. Dillon. Phat queens emerge fashionably late: body size and condition predict timing of spring emergence for bumble bee queens. *Insects*. 13(10): 870. doi: 10.3390/insects13100870

47. Alston, JM[G] , Dillon, M.E., Keinath, D.A., Abernethy, I.M., and J.R. Goheen. Daily torpor reduces the energetic consequences of microhabitat selection for a widespread bat. *Ecology* 103:e3677. doi: 10.1002/ecy.3677

46. Keaveny, E.C.[G], Waybright, S.A.[G], Rusch, T.W., and M.E. Dillon. Supercooling points of freeze-avoiding bumble bees vary with caste and queen life stage. *J. Therm. Bio.* 104:103196. doi: 10.106/j.therbio.2022.103196

2021

45. Woods, H.A., Pincebourde, S., Dillon, M.E., and J. Terblanche. Extended phenotypes: buffers or magnifiers of climate change? *Trends in Ecology & Evolution* 36(10): 889-898. doi: 10.1016/j.tree.2021.05.010

44. Lozier, J.D., Parsons, Z.M.[UG], Rachoki, L.[UG], Jackson, J.M.[G], Pimsler, M.L. Oyen, K.J.[G], Strange, J.P., and M.E. Dillon. 2021. Divergence in body mass, wing loading, and population structure reveals species-specific and potentially adaptive trait variation across elevations in montane bumble bees. *Insect Syst. and Div.* 5(5): 3, 1-15. doi: 10.1093/isd/ixab012

43. Walter, R.M.[G], Rinehart, J.P., Dillon, M.E., and K. Greenlee. 2021. Size constrains oxygen delivery capacity within but not between bumble bee castes. *J. Insect Physiology* 134:204297. doi: 10.1016/j.jinsphys.2021.104297

42. Oyen, K.J.[G], Jardine, L.E.[UG], Parsons, Z.M.[UG], Herndon, J.D.[G], Strange, J.P., Lozier, J.D., and M.E. Dillon. 2021. Body mass and sex, not local climate, drive differences in chill coma recovery times in common garden reared bumble bees. *J. Comp. Physiol. B.* 191:843-854. doi: 10.1007/s00360-021-01385-7

41. Hotaling, Scott, Shah, A.A., Dillon, M.E., Giersch, J.J., Tronstad, L.M., Finn, D.S., Woods, H.A., Kelley, J.L. 2021. Cold tolerance of mountain stoneflies (Plecoptera: Nemouridae) from the high Rocky Mountains. *Western North American Nat* 81(1):54-62. doi: 10.3398/064.081.0105

40. Pincebourde, S., Dillon, M.E., and H.A. Woods. 2021. Body size determines the thermal coupling between insects and plant surfaces. *Funct. Ecol.* 35: 1424-1436. doi: 10.1111/1365-2435.13801

2020

39. Pimsler, M.J., Oyen, K.J.[G], Herndon, J.D.[G], Jackson, J.M.[G], Strange, J.P., Dillon, M.E. and J.D. Lozier. 2020. Biogeographic parallels in thermal tolerance and gene expression variation under temperature stress in a widespread bumble bee. *Scientific Reports* 10(1):1-11. doi: 10.1038/s41598-020-73391-8

38. Hotaling, S. Shah, A.A., McGowan, K.L., Tronstad, L.M., Giersch, J.J., Finn, D.S., Woods, H.A., Dillon, M.E., and J.L. Kelley. 2020. Mountain stoneflies may tolerate warming streams: evidence from organismal physiology and gene expression. *Global Change Biology* 26(10):5524-5538. doi: 10.1111/gcb.15294

37. Shah, A.A., Dillon, M.E., Hotaling, S. and H.A. Woods. 2020. High elevation insect communities face shifting ecological and evolutionary landscapes. *Current Opinion in Insect Science* 41:1-6. doi: 10.1016/j.cois.2020.04.002

36. Jackson, J.M.[G], Pimsler, Meaghan L., Oyen, K.J[G], Strange, J. P., Dillon, M.E., and J.D. Lozier. 2020. Local adaptation across a complex bioclimatic landscape in two montane bumble bee species. *Molecular Ecology* 29:920-939. doi: 10.1111/mec.15376

35. Combes, S.A., Gagliardi, S., Switzer, C., and M.E. Dillon. 2020. Kinematic flexibility allows bumblebees to increase energetic efficiency when carrying heavy loads. *Science Advances* 6(6): eaay3115. doi: 10.1126/sciadv.aay3115

2019

34. Dillon, M.E., Lozier, J.D., 2019. Adaptation to the abiotic environment in insects: the influence of variability on ecophysiology and evolutionary genomics. *Current Opinion in Insect Science*, Neuroscience, Special section on Evolutionary Genetics and Genomics 36, 131–139. https://doi.org/10.1016/j.cois.2019.09.003

33. Giri, S.[G], Giri, B., and M.E. Dillon. 2019. An optimized approach for extraction and quantification of energy reserves in differentially fed bumblebees (*Bombus*). *Journal of Apicultural Research*. 58, 531–541. https://doi.org/10.1080/00218839.2019.1614728

32. Reade, A.J.[G], Dillon, M.E., Naug, D., 2019. Spare to share? How does interindividual variation in metabolic rate influence food sharing in the honeybee? *Journal of Insect Physiology* 112, 35–38. doi: 10.1016/j.jinsphys.2018.11.006

2018

31. Jackson, J.M.[G], Pimsler, M.L., Oyen, K.J.[G], Koch, J., Uhuad, J.B., Herndon, J.D.[G], Strange, J.P., Dillon, M.E., Lozier, J.D., 2018. Distance, elevation and environment as drivers of diversity and divergence in bumble bees across latitude and altitude. *Molecular Ecology* 27, 2926–2942. doi: 10.1111/mec.14735

30. Oyen, K. J.[G] and M.E. Dillon. 2018. Critical thermal limits of bumble bees (*Bombus impatiens*) are marked by stereotypical behaviors and are unchanged by acclimation, age, or feeding status. *Journal of Experimental Biology* 221(8):jeb165589. doi: 10.1242/jeb.165589

29. Giri, S.[G], Rule, D., and M.E. Dillon. 2018. Fatty acid composition in native bees: associations with thermal and feeding ecology. *Comparative Physiology and Biochemistry A* 218:70-79. doi: 10.1016/j.cbpa.2018.01.013

2017

28. Martinez del Rio, C. and M.E. Dillon. 2017. Sweet relief for pollinators. *Science* 355:686–687. doi: 10.1126/science.aam5323

27. Elzay, S.D.P.[G], Tronstad, L., and M.E. Dillon. 2017. Chapter 5: Terrestrial Invertebrates. In: Wildlife and Wind Farms: Conflicts and Solutions, Volume 1: Onshore. Pelagic Publishing, London, UK. 220 pp. Amazon

26. Gunderson, A., Dillon, M.E., and J. Stillman. 2017. Estimating the benefits of plasticity in ectotherm heat tolerance under natural thermal variability. *Functional Ecology* 31(8):1529-1539. doi: 10.1111/1365-2435.12874

25. Rader[G], J., Newsome, S. Sabat, P. Chesser, R., Dillon, M.E., and C Martinez del Rio. 2017. Isotopic niches support the resource breadth hypothesis. *Journal of Animal Ecology* 86(2):405-413. doi:10.1111/1365-2656.12629

2016

24. Oyen, K. J.[G], Giri, S.[G], and M.E. Dillon. 2016. Altitudinal variation in bumble bee (*Bombus*) critical thermal limits. *Journal of Thermal Biology* 59: 52-57. doi:10.1016/j.jtherbio.2016.04.015.

23. Sheldon, K.S., and M.E. Dillon. 2016. Beyond the Mean: Biological impacts of cryptic temperature change. *Integrative and Comparative Biology* 56(1): 110-119. doi:10.1093/icb/icw005

22. Dillon, M.E., Woods, H.A., Wang, G., Fey, S.B., Vasseur, D.A., Telemeco, R.S., Marshall, K., and S. Pincebourde. 2016. Life in the frequency domain: the biological impacts of changes in climate variability at multiple time scales. *Integrative and Comparative Biology* 56(1): 14-30. doi:10.1093/icb/icw024

21. Dillon, M.E. and H.A. Woods. 2016. Introduction to the symposium: Beyond the mean: biological impacts of changing patterns of temperature variation. *Integrative and Comparative Biology* 56(1): 11-13. doi:10.1093/icb/icw020

20. Lozier, J.D., Jackson, J.M.[G], Dillon, M.E., and J.P. Strange. 2016. Population genomics of divergence among extreme and intermediate color forms in a polymorphic insect. *Ecology and Evolution* 6: 1075–1091. doi:10.1002/ece3.1928

2015

19. Woods, H. A., Dillon, M.E., and S. Pincebourde. 2015. The roles of microclimatic diversity and of behavior in mediating the responses of ectotherms to climate change. *Journal of Thermal Biology* 54: 86-97. doi:10.1016/j.jtherbio.2014.10.002

18. Rader, J.A.[G], Dillon, M.E., Chesser, T., Sabat, P., and C. Martinez del Rio. 2015. Morphological divergence in a continental adaptive radiation: South American ovenbirds of the genus *Cinclodes*. *The Auk*. 132(1): 180-190. doi:10.1642/AUK-14-49.1

17. McDonald, D.B. and M.E. Dillon. 2015. Temporal changes in dominance networks and other behavior sequences. Chapter 7 In: Animal Social Networks. Oxford University Press, Oxford, UK. Amazon

2014

16. Wang, G. and M.E. Dillon. 2014. Recent geographic convergence in diurnal and annual temperature cycling flattens global thermal profiles. *Nature Climate Change* 4: 988-992. doi:10.1038/nclimate2378

15. Vogt, J.R.[G], Dillon, M.K. and M.E. Dillon. 2014. Tracheole investment does not vary with body size among bumblebee (*Bombus impatiens*) sisters. *Comparative Biochemistry and Physiology Part A: Molecular and Integrative Physiology* 174: 56-61. doi:10.1016/j.cbpa.2014.04.013

14. Dillon, M. E. and R. Dudley. 2014. Surpassing Mt. Everest: extreme flight performance of alpine bumblebees. *Biology Letters* 10(2): 20130922. doi:10.1098/rsbl.2013.0922

2013

13. Dillon, M.E. and M.R. Frazier. 2013. Thermodynamics constrains allometric scaling of optimal development time in insects. *PloS ONE* 8(12): e84308. doi:10.1371/journal.pone.0084308

12. Vogt, J.R.[UG] and M.E. Dillon. 2013. Allometric scaling of tracheal morphology among bumblebee sisters (Apidae: *Bombus*): compensation for oxygen limitation at large body sizes? *Physiological and Biochemical Zoology* 86(5): 576-587. doi:10.1086/672211

11. Shaha, R.K.[G], Vogt, J.R.[G], Han, C.S., and M.E. Dillon. 2013. A micro-CT approach for determination of insect respiratory volume. *Arthropod Structure and Development* 42(5): 437-442. doi:10.1016/j.asd.2013.06.003

2012

10. Dillon, M.E., Liu, R., Wang, G. and R.B. Huey. 2012. Disentangling thermal preference and the thermal dependence of movement in ectotherms. *Journal of Thermal Biology* 37(8): 631-639. doi:10.1016/j.jtherbio.2012.07.004

2010 and earlier

9. Dillon, M.E., Wang, G. and R. B. Huey. 2010. Global metabolic impacts of recent climate warming. *Nature* 467: 704-706. doi:10.1038/nature09407

8. Dillon, M.E., Wang, G., Garrity, P. A., and R. B. Huey. 2009. Thermal preference in *Drosophila*. *Journal of Thermal Biology* 34(3): 109-119. doi:10.1016/j.jtherbio.2008.11.007

7. Dillon, M.E., Cahn, L.R.Y.** and R. B. Huey. 2007. Life history consequences of temperature transients in Drosophila melanogaster. *Journal of Experimental Biology* 210(16): 2897-2904. doi:10.1242/jeb.007591

6. Dillon, M.E., Frazier, M.R., and R. Dudley. 2006. Into thin air: physiology and evolution of alpine insects. *Integrative and Comparative Biology* 46(1): 49-61. doi:10.1093/icb/icj007

5. Dillon, M.E., and M.R. Frazier. 2006. *Drosophila melanogaster* locomotion in cold thin air. *Journal of Experimental Biology* 209: 364-371. doi: 10.1242/jeb.01999

4. Dillon, M.E., and R. Dudley. 2004. Allometry of maximal vertical force production during hovering flight of neotropical orchid bees (Apidae: Euglossini). *Journal of Experimental Biology* 207(3): 417-425. doi:10.1242/jeb.00777

3. Huey, R.B., Eguskitza, X., and M.E. Dillon. 2001. Mountaineering in thin air. pp 225-236 In: Hypoxia: From Genes to the Bedside. Edited by Roach, R.C., Wagner, P.D., and Hackett, P.H. Advance in Experimental Medicine and Biology vol. 502. Kluwer Academic/Plenum, New York, NY. Amazon

2. Dillon, M.E., and J. Fiaño. 2000. Oviposition site selection by the Tungara frog (*Physalaemus pustulosus*). Copeia 2000(3): 883-885. doi:10.1643/0045-8511(2000)000[0883:OSSBTT]2.0.CO;2

1. Chai, P., Altshuler, D.L., Stephens, D.B., and M.E. Dillon. 1999. Maximal horizontal flight performance of hummingbirds: effects of body mass and molt. Physiological and Biochemical Zoology 72(2): 145-155. doi:10.1086/316652

Patents

2021. Oyen, Kennan, Michael E. Dillon. Apparatus for temperature modulation of samples. US11077443B2.

Teaching and Training Activities

Undergraduate courses

Animal Biology, Comparative Environmental Physiology (lecture and laboratory), Human Systems Physiology, Integrative Physiology, Writing in the Biological Sciences, Human Adaptation to Altitude

Graduate courses

Physiological Ecology of Plants and Animals, Biochemical Adaptation, LTER Seminar, Ecophysiology, Hands-on R, Climate Physiology, Skill sets for Grads

Undergraduate Advising and Mentorship

Current laboratory researchers:

Elsa Petzholdt (Spring 2025 -)
Camden Foley (UG, Spring 2025 -)
Hannah Vanderlinden (UG, Fall 2024 -)
Lauren Vaninger (UG, Fall 2024 -)
Clara (UG, Fall 2023 – Summer 2024)
Greg (UG, Summer 2024)

Graduate Mentorship

Ripken Wellikson (2025—present); M.S. Zoology and Physiology
Sabrina White (2022—present); PhD, Program in Ecology NSF GRFP 2023

D.M. Shayne Dodge (2019—present); PhD, Zoology and Physiology
Sarah Waybright (2019—2025, PhD); postdoctoral fellow UC, Davis
Ellen Keaveny (2018—2025, PhD); postdoctoral fellow UNC, Chapel Hill
Claire Campion (MS 2023), Educational outreach, Minneapolis, MN
Christy Bell (MS, 2019)
Delina Dority (MS, 2019); NSF GRFP
Kennan Oyen (Ph.D., 2018); postdoc, University of Cincinatti
Susma Giri (Ph.D., 2016); Faculty, Kathmandu Institute of Applied Sciences
Sarah DePaolo (MS, 2015); Ph.D., Oklahoma State University, Stillwater
Jonathan Rader (MS, 2014, co-advised with C. Martinez del Rio), Ph.D., UNC
Olivia H.A. Nater (MS, 2014); Communications Director, Population Connection
Jessica R. Vogt (MS, 2014); Ph.D., University of Arizona, Wildlife Biologist, BLM
Rajib K. Shaha (MS, 2014); Ph.D., University of Wyoming

Postdoctoral Sponsorship

Jordan Glass (2023–present)
Travis Rusch (2020-2022), Research Scientist, USDA, Kansas
Kimberly Sheldon (NSF Postdoctoral Scholar, 2014-2016); Associate Professor, University of Tennessee.

Administration

Director, WyldTech: Center for Wildlife, Technology, and Computing 2025—

Interim Director, UW-AMK Research Institute 2022—2025

Director of the University of Wyoming National Park Service Research Station in Grand Teton National Park from 2016-2020. Oversaw 2 permanent benefited staff, 3 additional summer staff, and 2 additional part-time facilities workers, managed a $150,000 budget, oversaw a seed grant program awarding 11-12 grants ($60,000) annually, ran a summer seminar series with public bbqs attracting 80-200 people for each of ~10 talks by prominent speakers, and served as Editor-in-chief of the annual reports published in the UW repository, all while also managing the day-to-day housing, cleaning, pest management, and facilities maintenance for a heavily-used UW resource (~4400 user nights every season). I oversaw the negotiation of a new 20 year General Agreement between UW and NPS in 2018 and secured over $5 million in UW funding for station improvements. Extensive communication with stakeholders, including the President, Vice Presidents, and Trustees has made the Research Station a top priority for the University and a key element of ongoing strategic planning.

Synergistic Activities

Cross-Pollinations of Art & Science. Beginning with an interactive installation on exhibit in 2016 at the Ucross Foundation Art Gallery near Sheridan, Wyoming, I have ongoing collaborations with a group including 4 scientists and 4 artists, the topic of a *documentary film* and with extensive national media coverage (http://thinkwy.org/ucrossproject). Sculptor AH Carlisle and I developed and toured a show in Laramie and in Rock Springs, WY exploring adaptations of bumble bees to altitude and playing with the tension between positive and negative reactions to bees.

Flight of the Bombus, Xbox Kinect video game. In collaboration with the UW Biodiversity Institute and the UW Shell 3-D visualization center, we developed an interactive video

game on the Xbox Kinect platform that allows the user to flap their arms to control a flying bumblebee as it navigates between flowers in alpine meadows. The program recognizes changes in wing size (when users fold their arms) and kinematics (stroke frequency and amplitude) to simulate the physics of flight at different elevations, a key element of a collaborative grant (NSF-DEB 1457659). The game debuted at the Jackson Hole Wild Science Festival in Jackson, WY in October 2016; after over 300 "kids" aged 3 to 89 were able to try it out and give us feedback, the modified version are on permanent exhibit in the UW Biodiversity Institute and at the University of Alabama

Field Guide to the Native Bees of Wyoming. In collaboration with UW colleagues and the UW Biodiversity Institute and with funding from the Bureau of Land Management and the US Fish and Wildlife Service, I wrote a field guide to the ~120 most common bee genera in the state. The project has emerged out of dozens of public talks and workshops I have given around the state in the last 10 years. The target audience is the general public, state and federal officials tasked with management of public lands, gardening clubs, restoration experts, and the agricultural industry.

Get Buzzing: the effects of pesticides on bees dance/drama. With a UW colleague in Theater and Dance and a professional dancer/choreographer, I worked with UW undergraduate students to develop a performance exploring the effects of pesticides on bees. Aside from three performances in Hawaii, the show was performed at 2 local theatres and at several elementary schools in Laramie, WY.

Service

2025— Associate Editor, Journal of Insect Physiology

2024— Consulting collaborator, Core research plan, USDA-ARS, Fargo, ND

2023–2024 Suckley's bumble bee status assessment team (USFWS, ESA)

2022— University of Wyoming Program in Ecology Graduate Affairs Committee

Associate Editor, Frontiers in Bee Science

2019– Editorial Board, Insects

2021–2023 Western Bumble bee status assessment team (USFWS, ESA)

2017–2022 Assistant Editor, Editorial Board, Integrative and Comparative Biology

2014–2018 Secretary, Division of Ecology and Evolution, Society for Integrative and Comparative Biology

Grant refereeing: NSF BIO IOS, DAB, DEB (ad-hoc and panels), European Research Council

Manuscript and book refereeing: Nature, PNAS, Science, Biological Journal of the Linnean Society, Ecology Letters, Ecology, Biology Letters, Evolution, Proceedings of the Royal Society B, Journal of Experimental Biology, Functional Ecology, Ecosphere, Molecular Ecology, Global Ecology and Biogeography, Physiological and Biochemical Zoology, Ecological Monographs, Journal of Theoretical Biology, Ecological Entomology, Integrative Zoology, Annales Zoologici Fennici, Ecology, Genetica, Journal of Insect Science

University: Entrepreneurial-Innovation Pillar Team, Strategic Scenario Planning Committee (2021), Budget Reduction Working Group – Faculty Advisory Council (2020), AMK Task Force (2019—), Wyoming Research Scholars Coordinator Search Committee (2018), Faculty Senate (2009—2014), Science and Mathematics Teaching Center, Board of Directors (2012

—2015), College of A& S Summer Independent Study Award Committee (2013—2016), Program in Ecology Graduate Affairs Committee (2014—2016)

Departmental: Justice, Equity, Diversity and Inclusivity Team (co-chair 2020–), Student Scholarships Committee (chair 2019–), L. Floyd Clarke Committee (chair 2014—2020), Department Head Advisory Committee (2014—2018, 2021—), Zoology Curriculum Committee (2009—present, chair 2012—present), Developmental Neurobiologist Search Committee (2010), Physiology Curriculum Committee (2009—2012), Developmental Biologist Search Committee (2009)

Invited Presentations (Since 2010)

2024—Modeling organism responses to climate change symposium, Society for Integrative and Comparative Biology annual meeting; UW Madison Center for Ecology and the Environment, graduate student invited keynote speaker for annual symposium; Entomology Society of America Pacific Branch annual meeting invited talk for symposium: Climate Change & Insect Declines: Life History Strategies Overcoming Environmental Challenges

2023—5th workshop of Ecological and Behavioral Physiology, plenary speaker. Thermal ecology of pollinators symposium, Entomological Society of America annual meeting.

2022—Iowa State, Dept of Biology; Pennsylvania State University, Dept of Biology; University of New Mexico, Dept of Biology, University of North Carolina, Greensboro, Dept of Biology

2021—Western North American Naturalist Symposium (virtual); Department of Entomology, University of Kentucky; New Mexico State University, Dept of Biology; Entomological Society of America symposium; Arizona State University Social Insects Group

2020—Rocky Mountain Biological Labs summer seminar program, Gothic, CO; CU Boulder EBIO Graduate Student Colloqium Speaker, *Penn State (cancelled), NMSU (cancelled)*

2019—Wyoming Bee College, UC Davis, Invited professorship, IRBI, Tours, France, International Pollinator Conference, Bombus2.0

2018—IRBI, Tours, France; Bee*havior* Art Exhibit, Rock Springs, WY.

2017—Symposium co-organizer EntSoc, Denver, CO. Separate invited symposium talk, EntSoc annual meeting, Denver, CO. Invited speaker, BOMBUSS conference, Logan, UT. Beehavior: Extracting the Sweetness, exhibition with sculptor AH Carlisle at the UW Berry Center.

2016—Society-wide symposium organizer, SICB; International Congress of Entomology, UW Sci-Art Symposium, Saturday U Jackson WY, Field Stations Workshop, Capitol Reef, UT

2015—Experimental Biology Annual Meeting, Colorado State University, North Dakota State University, Entomological Society of America, Behaviour

2014—University of Montana, University of Alabama, Mathematical Association of America Rocky Mountain Section Conference, Society for Experimental Biology, Heteroclim workshop, World Congress of Biomechanics, Gordon Conference: Unifying Ecology Across Scales, University of Denver, Science Cafe Laramie WY, Saturday U in Ucross WY, and Laramie WY.

2013—Macrophysiology II: Predicting the biological impacts of climate change.

2012—Entomological Society of America annual meeting (2 invited symposia talks). UW Discovery Days

2011—Montana State University, 22nd Pacific Science Congress, Kuala Lumpur, Malaysia

2010—National Center for Biological Sciences, Indian Institute of Science, Ahmednagar College, India; UW-NPS Research Station WY, American Physiological Society