

MICHAEL E. DILLON

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Education and Academic Positions

- 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 \$9.6 million USD in grant funding since 2010 (~\$870,000/year on average)

- 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 with 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 with 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)

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

2322 citations, h-index: 21

^{UG} Undergraduate student, ^G Graduate student

Alston, JM, Dillon, M.E., Keinath, D.A., Abernethy, I.M., and J.R. Goheen. Temperature-dependent use of daily torpor attenuates the energetic consequences of habitat selection for a widespread bat. *In revision* (Sept 2021), *Ecology*

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. *In review*, *Flora*.

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](https://doi.org/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](https://doi.org/10.1093/isd/ixab012)
43. Walter, R.M.^G, Rinehart, J.P., Dillon, M.E., and K. Greenlee. 2021. Size constrains hypoxia tolerance within but not between bumble bee castes. *J. Insect Physiology* 134:204297. doi: [10.1016/j.jinsphys.2021.104297](https://doi.org/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](https://doi.org/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](https://doi.org/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 plan surfaces. *Funct. Ecol.* 35: 1424-1436. doi: [10.1111/1365-2435.13801](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1016/j.jinsphys.2018.11.006)

2018

31. Jackson, J.M.^G, Pimslser, 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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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

~20-40 undergraduate majors advised annually

Current laboratory researchers:

Taylor Hatcher (BS Physiology 2021) – INBRE Research Scholar

Rachel Sucharski (BS Zoology 2023) – Wy Research Scholar

Laboratory alumni:

Ethan Rowe (BS Zoology 2021)-WY Research Scholar, WY Nasa Space Grant scholar; PhD student, Auburn University

Sarah Wannemuehler (BS WFBM, 2021) – WY Research Scholar, WY Nasa Space Grant scholar

Anna Cressman (BS WFBM, 2019); MS student, Pennsylvania State University

Roman Winter (BS Zoology 2021)

Zach Parsons (BS Zoology 2019); Environmental Consultant, WEST, Inc.

Kayle Alles (BS Physiology 2017); PhD program, Chemical Engineering, Univ Nebraska-Lincoln

Christian Stewart (BS Physiology 2017)

Lois Rachocki (BS Computer Science 2018)

Annika Dotson (BS Physiology 2017)
Shawna Wolf (BA Music Performance 2017)
Annie Krueger (BS Physiology 2016); A&S Outstanding Grad, grants from: EPSCoR, INBRE, WRSP, NASA Space Grant; Bayer Crop Sciences
Laura Jardine (NSF REU); Biology, Oklahoma State University
Leon Miller (BS Biology and Teaching 2014); Biology teacher, Rock Springs, WY
Shelby Oelklaus (BS Physiology 2014); New York University Public Health
Mary Centrella (BS Zoology 2013); Goldwater Scholar, A&S Outstanding Grad, grants from: EPSCoR, NASA Space Grant, NSF GRF; Ph.D. program Cornell University
Jake Peters (BS Zoology 2012); Goldwater Scholar, grants from: EPSCoR, INBRE, NASA Space grant; Ph.D. program Harvard University
Justin Romano (BS Physiology 2012); grants from: EPSCoR; WWAMI Program
John Bruno (BS Physiology 2012); EMT, Casper WY, *MS* student, UW Neuroscience

Graduate Mentorship

Claire Campion (2020—present); M.S., Zoology and Physiology
Craig Garzella (2020—present); Ph.D., Program in Ecology
David M.S. Dodge (2019—present); PhD, Zoology and Physiology
Sarah Waybright (2019—present); Ph.D., Program in Ecology
Ellen Keaveny (2018—present); Ph.D., Program in Ecology
Christy Bell (MS, 2019); PhD candidate, Zoology and Physiology
Delina Dority (MS, 2019); NSF GRFP
Kennan Oyen (Ph.D., 2018); postdoc, University of Cincinnati
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); Friends of the Earth, Scotland
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

Travis Rusch (2020-2022)
Kimberly Sheldon (NSF Postdoctoral Scholar, 2014-2016); Assistant Professor, University of Tennessee.

Administration

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

2019–2021 Editorial Board, *Insects*

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)

- 2021—Western North American Naturalist Symposium (virtual); Department of Entomology, University of Kentucky; Entomological Society of America symposium; Pennsylvania State University, Dept of Biology; New Mexico State University, Dept of Biology; Arizona State University Social Insects Group
- 2020—Rocky Mountain Biological Labs summer seminar program, Gothic, CO; CU Boulder EBIO Graduate Student Colloquium 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; *Behavior* 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. Behavior: 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

Conference presentations (since 2014)

^{UG} Undergraduate student, ^G Graduate student

Dillon, M.K. and M.E. Dillon. Oogenesis-flight syndrome in bumble bees: effects of reproductive state on energy stores. Poster, Entomological Society of American annual meeting, Denver, CO.

- Garzella, C.S.^G and M.E. Dillon. Movement modeling as a tool to study insect behavior on thermal landscapes. Poster, Entomological Society of American annual meeting, Denver, CO.
- Rusch, T.W., Garzella, C.S.^G, Waybright, S.W.^G, Dodge, D.M.S.^G, and M.E. Dillon. Exploring potential overwintering strategies of bumble bee queens to optimize survival. **Invited symposium talk**, Entomological Society of American annual meeting, Denver, CO.
- Keaveny, E.C.^G, Rowe, E.^{UG}, and M.E. Dillon. Timing of spring emergence varies with body size within and among bumble bee species. Poster, Entomological Society of American annual meeting, Denver, CO.
- Waybright, S.W.^G, Rusch, T.W., Keaveny, E.C.^G, and M.E. Dillon. Winter temperature variability alters cold tolerance of overwintering queen bumble bees. Poster, Entomological Society of American annual meeting, Denver, CO.
- Campion, C.C.^G, T.W. Rusch, and M.E. Dillon. Keeping bumble bees in the dark: light exposure alters reproductive success of microcolonies. Poster, Entomological Society of American annual meeting, Denver, CO.
- Dodge, D.M.S.^G and M.E. Dillon. Shifts in the temperature dependence of metabolic rate in overwintering bumble bee queens. Poster, Entomological Society of American annual meeting, Denver, CO.
- Hatcher, T.M.^{UG}, M.K. Dillon, J.B. Koch, J.P. Strange, J.D. Lozier, and M.E. Dillon. Expression of ion-gated channels and population differentiation in cold tolerance of bumble bees (genus *Bombus*). Poster, Entomological Society of American annual meeting, Denver, CO.
- Campion, C.C.^G, A. Rajamohan, M.E. Dillon, and J.P. Rinehart. Comparative analysis of cryopreservation of spermatozoa from *Bombus impatiens* and *Apis mellifera*. Talk for the Society of Cryobiology annual meeting (virtual).
- Waybright, S.W.^G and M.E. Dillon. Effects of ground temperature on the energy use and survival of queen bumble bees. Invited talk for Western North American Naturalist Symposium on Impacts of Climate Change on Western North American Ecosystems (April 2, virtual).
- Keaveny, E.C.^G and M.E. Dillon. How bumble bees weather a late season cold snap. Invited talk for WNAN Symposium on Impacts of Climate Change on Western North American Ecosystems (April 2, virtual).
- Dillon, ME, KJ Oyen, JD Herndon, ML Pimsler, JP Strange, JD Lozier. A climate wise of temperature extremes may explain past and predict future bumble bee range shifts. Invited talk for WNAN Symposium on Impacts of Climate Change on Western North American Ecosystems (April 2, virtual).
- Keaveny, E.^G, and M.E. Dillon. *Lipid composition of bumble bees and their pollen diets: bees are (mostly) what they eat*. Talk for SICB annual meeting (virtual in Jan. 2021).
- Waybright, S.^G, and M.E. Dillon. *Do bumble bees cultivate yeast to augment protein in the larval diet?* Talk for SICB annual meeting (virtual in Jan. 2021).
- Garzella, C.^G, and M.E. Dillon. *Ground-truthing microclimate models: can we use large-scale macroclimate to predict temperatures organisms experience in the soil?* Talk for SICB annual meeting (virtual Jan. 2021).

2020

- Rowe, E.^{UG}, and M.E. Dillon. *Behavioral predictors of and effects of parasites on colony initiation in bumble bees*. Poster for Entomological Society of America virtual annual meeting, November 2020.
- Dodge, D.M.S.^G, Dillon, M.K., and M. E. Dillon. *Not just cold: evidence of metabolic suppression during diapause in the bumble bee (*Bombus impatiens*)*. Talk for Entomological

- Society of America virtual annual meeting, November 2020.
- Campion C.^G, Rajamohan, A., M. E. Dillon, and J. P. Rinehart. *Effects of cryopreservation on *Bombus impatiens* spermatazoa*. Poster for Entomological Society of America virtual annual meeting, November 2020.
- Keaveny, E.^G, and M.E. Dillon. *Worker bumble bees benefit from heated brood*. Talk for Entomological Society of America virtual annual meeting, November 2020.
- Waybright, S.^G, and M.E. Dillon. *Effects of ground temperature on survival and energy usage of overwintering queen bumblebees*. Talk for Entomological Society of America virtual annual meeting, November 2020.
- Dillon, M.K., and M. E. Dillon. *Thermoregulatory responses to diapause induction cues vary with caste and life stage in bumble bees*. Poster for Entomological Society of America virtual annual meeting, November 2020.
- Cobb NS, and 54 co-authors including Dillon, ME. *Integrating Bee Specimen data to promote evolutionary-ecological research in a keystone clade (iDigBees)*. Entomological Collections Network Annual Meeting.
- Hotaling S, Shah A.A., Cline T.J., Giersch J.J., McGowan KL, Tronstad LM, Finn DS, Woods HA, Peitzsch E, Florentine C, Jacobsen D, Dillon M.E., Kelley J.L., and C.C. Muhlfield. *Assessing the future of mountain stream biodiversity from genes to communities*. Society for Freshwater Science Annual Meeting.
- Tronstad, L.M., Hotaling, S., Finn, D.S., Shah, A.A., and M.E. Dillon. *Western Glacier Stonefly (*Zapada glacier*): Wyoming's first invertebrate listed under the Endangered Species Act*. Talk for American Fisheries Society virtual meeting.
- Dillon, M.E. *Geographic variation in thermal tolerance of bumblebees: underlying mechanisms and broader implications*. CU, Boulder, Department of Ecology and Evolutionary Biology, **graduate student invited speaker**
- Loseke, J.^G, Schmitt, E.E., Dillon, M.E., Zamora, M.^G, Green, C.^G, Smith, D.T., Johnson, E.C. *Exercise Heat Exposure Induced Changes In Genetic Expression Before And After Heat Acclimation In Humans*. *Medicine & Science in Sports & Exercise* 52(7S):529. Talk.
- Petranek, C.^G, and ME Dillon. *Induced flow cools hovering bumblebees*. Talk at SICB annual meeting, Austin, TX.
- Keaveny, E.^G, and M.E. Dillon. *Reciprocal thermal benefits of brood thermoregulation by bumblebees*. Poster at SICB annual meeting, Austin, TX.

2019

- Dillon, ME, KJ Oyen, JD Herndon, ML Pimsler, JP Strange, JD Lozier. *Thermal tolerance and bumblebee distributions under past and future climates*. Invited talk for Bombus2.0, Toronto, CA.
- Dillon, ME, KJ Oyen, JD Herndon, ML Pimsler, JP Strange, JD Lozier. *A climate wise of temperature extremes may explain past and predict future bumble bee range shifts*. Invited talk for International Pollinator Conference, Davis, CA.
- Lozier, J, JJ Jackson, ML Pimsler, KJ Oyen, ME Dillon, JP Strange. *Biogeography and functional genetics of thermal tolerance across latitude and elevation in a widespread bumble bee*. Poster for Gordon Research Conference on Ecological and Evolutionary Genomics, Manchester, NH.
- Keaveny, E.^G, Helling, M.^G, Goodenough, A.^G, Basile, F., Rule, D.C., and M.E. Dillon. *Metabolomic and lipidomic signatures of thermal tolerance in bumblebees*. Poster at the Experimental Biology meeting, Orlando, FL.
- Dillon, M.E., Woods, H.A., and S. Pincebourde. *Sampling frequency in thermal ecology: do missed*

extremes and interpolated means matter? Talk at the Society for Integrative and Comparative Biology annual meeting, Tampa, FL.

Parson, Z.^{UG}, Herndon, J.D.^G, Strange, J.P., Lozier, J.D., and M.E. Dillon. Altitudinal variation in flight morphology and kinematics of common-garden reared bumblebees (*Bombus vosnesenskii*). Poster at the Society for Integrative and Comparative Biology annual meeting, Tampa, FL.

Lozier, J.D., Pimler, M.L., Oyen, K.J., Jackson, J.M.^G, Herndon, J.D.^G, Strange, J.P., and M.E. Dillon. Biogeography and functional genetics of thermal tolerance across latitude and elevation in a widespread bumble bee. Talk at the Society for Integrative and Comparative Biology annual meeting, Tampa, FL.

2018

Alston, J.M.^G, Abernethy, I.M., Dillon, M.E., Keinath, D.A., and J.R. Goheen. Metabolic costs of climate change in a temperate bat. American Society of Mammalogists annual meeting. Manhattan, KS.

Dillon, M.E., Oyen, K.J.^G, Pimsler, M.L. Herndon, J.D.^G, Strange, J.P., and J.D. Lozier. Geographic variation in bumble bee morphology: evidence for the influence of heterothermy and flight on insect size clines. Society for Integrative and Comparative Biology annual meeting, San Francisco, CA.

Oyen, K.J.^G, Prather, J.P., Herndon, J.D., Strange, J.P. and M.E. Dillon. A comparison of flight muscle action potentials during chill coma onset in high and low altitude bumble bees reared in common garden conditions. Society for Integrative and Comparative Biology annual meeting, San Francisco, CA.

Tronstad, L.M., S. Hotaling, J.J. Giersch, D.S. Finn, O.J. Wilmot, A. Shah, and M.E. Dillon. Alpine stoneflies of the Teton Range: their habitat, distribution and status. The Wildlife Society-Wyoming Chapter, Laramie, Wyoming.

Bell, C.^G, L.M. Tronstad and M.E. Dillon. Species distribution models of the Western Bumble Bee, *Bombus occidentalis*, in Wyoming. The Wildlife Society-Wyoming Chapter, Laramie, Wyoming.

Crawford, M.^{UG}, D. Dority^G, L.M. Tronstad, and M.E. Dillon. Investigating potential effects of wind turbine color on attracting insects. The Wildlife Society-Wyoming Chapter, Laramie, Wyoming.

Dillon, M.E., Strange, J.P., Lozier, J.D. Lozier. Geographic variation in bumble bee thermal tolerance: implications for past and future range shifts. The American Physiological Society annual meeting, New Orleans, LA.

Dority, D.^G, L.M. Tronstad and M.E. Dillon. Investigating ecological effects of wind farms on insect communities. The Wildlife Society-Wyoming Chapter, Laramie, Wyoming.

2017

Jackson, JM^G and Lozier, JD and Pimsler, ML and Dillon, ME and J.P. Strange. 2017. Investigating genomic patterns of adaptation and gene flow in montane bumble bees. Talk at the Society for Integrative and Comparative Biology annual Meeting. New Orleans, LA.

Jardine, LJ^{UG} and Parsons, Z^{UG} and Oyen, KJ^G and Strange, JP and Dillon, ME. 2017. Sex differences in chill coma recovery times of bumblebees (*Bombus vosnesenskii*) reared in common-garden conditions. Poster at the Society for Integrative and Comparative Biology annual Meeting. New Orleans, LA.

Parsons, Z^{UG} and M.E. Dillon. 2017. Geographic variation in bumblebee flight morphology suggests aerodynamic limitations on upslope range shifts. Poster at the Society for Integrative and Comparative Biology annual Meeting. New Orleans, LA.

- Delfino, R^{UG} and Sprayberry, JDH and ME Dillon. 2017. Flowering phenology in subalpine meadows of Grand Teton National Park. Poster at the Society for Integrative and Comparative Biology annual Meeting. New Orleans, LA.
- Petranek, CJ^G and Duennes, MA and Martinez, O and Merida, J and Pineda, E and Rachocki, L^{UG} and Parsons, Z^{UG} and Lozier, JD and ME Dillon. 2017. Patterns of wing shape differentiation across elevational gradients in North American bumble bees (Apidae: *Bombus*). Poster at the Society for Integrative and Comparative Biology annual Meeting. New Orleans, LA.
- Bell, C.^G, M.E. Dillon, and L. Tronstad. Species distribution models of the Western Bumble Bee, *Bombus occidentalis*, in Wyoming using historic and current data. Talk at the Conference of the Wildlife Society, Wyoming Chapter. Jackson, WY.
- Gunderson, A., M.E. Dillon, and J. Stillman. Estimating the benefits of plasticity in ectotherm heat tolerance under natural thermal variability. Talk at the annual meeting of the Society for the Study of Evolution. Portland, OR.
- Jackson, J.^G, Pimsler, M., Oyen K.^G, Dillon, M.E., Strange, JP, and J.D. Lozier. Isolation by distance, environment, and adaptation across latitude and altitude gradients in two montane bumble bees. Talk at the annual meeting of the Entomological Society of America. Denver, CO.
- Pimsler, M., Oyen K.^G, Herndon, J.D.^G, Dillon, M.E., Strange, JP, and J.D. Lozier. Feeling the heat: Gene expression and thermal tolerance across elevation and latitude in a widespread montane bumble bee. Talk at the annual meeting of the Entomological Society of America. Denver, CO.
- Oyen K.^G, Pimsler, M., Herndon, J.D.^G, Jackson, J.^G, Strange, JP, J.D. Lozier, and M.E. Dillon. Common garden experiments reveal local adaptation in critical thermal limits of bumble bees (Apidae, *Bombus*). Talk at the annual meeting of the Entomological Society of America. Denver, CO.
- Oyen K.^G and M.E. Dillon. Critical thermal limits of the heterothermic bumble bee, *Bombus impatiens* (Hymenoptera: Apidae). Poster at the annual meeting of the Entomological Society of America. Denver, CO.
- Bell, C.^G, M.E. Dillon, and L. Tronstad. Species distribution models of the Western Bumble Bee, *Bombus occidentalis*, in Wyoming using historic and current data. Poster at the annual meeting of the Entomological Society of America. Denver, CO.
- Parsons, Z.P.^{UG}, Oyen K.^G, Strange, JP, Lozier, J.D. and M.E. Dillon The influence of pile length and body size on rates of heat loss in the bumble bee, *Bombus vosnesenskii*. Poster at the annual meeting of the Entomological Society of America. Denver, CO.
- Dillon, M.E., S. Chown, and R.B. Huey. Impacts of recent climate warming on insect metabolism. **Invited symposium** talk at the annual meeting of the Entomological Society of America. Denver, CO.
- Oyen, K.G, and M.E. Dillon. Symposium: Insect microclimates in a changing world. **Led a symposium** at the annual meeting of the Entomological Society of America. Denver, CO. 9 speakers from around the world.

2016

- Dillon, M.E., H. Arthur Woods, and Michael Sears. Beyond the mean: Biological impacts of changing patterns of temperature variation. **Society-wide symposium** at the Society for Integrative and Comparative Biology annual Meeting. Portland, OR. **Lead organizer**.
- Krueger, A.J.^{UG} and M.E. Dillon. Determining the realistic toxicity of imidacloprid for a native bee, *Bombus impatiens*. Oral presentation at the Front Range Student Ecology Symposium, Fort Collins CO. **Selected as the best student presentation**.

Dority, D.^G, L. Tronstad, and M.E. Dillon. Ecological effects of wind farms: investigating plant-pollinator interactions. Poster presentation at the Front Range Student Ecology Symposium, Fort Collins CO.

Krueger, A.J.^{UG} and M.E. Dillon. Detecting sub-lethal effects of imidacloprid for bumble bee (*Bombus impatiens*) workers. 2016. Oral presentation at the Society of Environmental Toxicology and Chemistry annual meeting, Orlando, FL.

Dillon, M.E. and R. Dudley. Bumblebee flight across a 9000 m elevation gradient. **Invited symposium presentation** at International Congress of Entomology, Orlando, FL.

Giri, S.G.^G and M.E. Dillon. Interactive effects of temperature and parasites on energy reserves of native bees. Oral presentation at the Society for Integrative and Comparative Biology annual Meeting. Portland, OR.

Sheldon, K.S. and M.E. Dillon. Integrating climatic variation and population-level variation into models to predict climate change impacts. **Invited symposium presentation** at the Society for Integrative and Comparative Biology annual Meeting. Portland, OR.

Gagliardi, S.F., Dillon, M.E., and S. A. Combes. Do bumblebees carry loads for free? Oral presentation at the Society for Integrative and Comparative Biology annual Meeting. Portland, OR.

Aragon, C., and M.E. Dillon. Bee Aware. **Invited presentation** for the Re-envisioning the laboratory Sci-Art Symposium, UW, Laramie, WY.

2015

Krueger^{UG}, A., Sheldon, K.S., and M.E. Dillon. Thermal tolerance of *Bombus impatiens* after dietary exposure to imidacloprid. Conference poster at the SICB annual meeting, West Palm Beach, FL.

Rader, J.A.^G, Dillon, M.E., and C. Martinez del Rio. Isotopic niches are not conservative and confirm Brown's resource breadth hypothesis. Conference talk at the SICB annual meeting, West Palm Beach, FL.

Oyen, K.J.^G, Sheldon, K.S., and M.E. Dillon. The effects of body size and acclimation on thermal tolerance of native bees. Conference poster at the SICB annual meeting, West Palm Beach, FL.

DePaolo, S.^G, Tronstad, L. and M.E. Dillon. Do plant characteristics predict pollen-limitation and susceptibility to phenological mismatch in a warming world? Conference poster at the SICB annual meeting, West Palm Beach, FL.

Sheldon, K.S., and M.E. Dillon. Beyond the mean: biological impacts of cryptic temperature change. Conference talk at the SICB annual meeting, West Palm Beach, FL.

Dillon, M.E. and G. Wang. Biological implications of recent geographic convergence in daily and annual temperature cycles. Conference talk at the SICB annual meeting, West Palm Beach, FL.

Dillon M.E. Integrating temperature variation into predictions of climate change impacts. Invited symposium talk at the Experimental Biology annual meeting, Boston, MA.

Krueger, A.^{UG}, and M.E. Dillon. Determining the realistic toxicity of Imidacloprid for a native bee species, *Bombus impatiens*. Conference talk at the Rocky Mountain Chapter of the Society for Environmental Toxicology and Chemistry annual meeting in Fort Collins, CO.

Dillon, M.E. Integrating temperature variation into predictions of climate change impacts. Invited speaker, Colorado State University Department of Biology Seminar series.

Dillon, M.E. Physiological limits to upslope range shifts in pollinators. Invited symposium speaker at the Entomological Society of America annual meeting in Minneapolis, MN.

Dillon, M.E. Beyond the mean: incorporating variation into predictions of climate change impacts. Invited speaker, North Dakota State University Department of Biology seminar series.

Krueger, A.***, Oyen, K.J.*, Sheldon, K.S., and M.E. Dillon. Effect of dietary exposure to field-realistic concentrations of imidacloprid on activity, metabolism, and cold tolerance of *Bombus impatiens*. Poster presentation at the Society for Environmental Toxicology and Chemistry Annual meeting in Salt Lake City, UT. *Selected as a best student presentation

Invited symposium speaker for the Behavior annual meeting in Cairns, Australia. Declined invitation because of lack of funding.

2014

Rader, J. A.^G, Dillon, M.E., and C. Martinez del Rio. Delineating ecological niches and their evolution from stable isotopes and museum specimens. Talk at Society for Integrative and Comparative Biology annual meeting, Austin, TX.

Dillon, M.E. Flying Mt. Everest: How alpine bumble-bees fly where helicopters fail. Invited seminar, University of Alabama, Department of Biology seminar series, Tuscaloosa, AL.

Dillon, M.E. Flying high on the wings of bees. Invited seminar, University of Montana, Department of Biology departmental seminar series, Missoula, MT.

Dillon, M.E., Wang, G., and R.B. Huey. *Global metabolic impacts of climate warming: why nonlinearity matters*. Invited symposium speaker: Mathematical Association of America Rocky Mountain Section meeting, Laramie, WY.

Dillon, M.E., and R. Dudley. Flying Mt. Everest: morphology and kinematics for flight in thin air. Invited symposium speaker. World Congress of Biomechanics, Boston, MA.

Woods, H.A., Dillon M.E. and S. Pincebourde. Insects in changing climates: the challenges of integrating microclimates and behavioral thermoregulation into realistic predictions. Invited symposium talk, Society for Experimental Biology annual meeting, Manchester, UK.

Sheldon, K.S., and M.E. Dillon. Beyond the mean: biological impacts of cryptic temperature change. Invited poster, Heteroclim workshop, Paris, France.

Dillon, M.E. Challenges to predicting metabolic impacts of global temperature change. Invited speaker, Unifying Ecology Across Scales Gordon Research Conference, New Biddiford, ME.

Dillon, M.E. Beyond the mean: challenges to predicting biological impacts of climate change. Invited speaker, Department of Biology seminar series, University of Denver, Denver, CO.

Dillon, M.E., and M.R. Frazier. 2012. Development time, seasonality, and body size clines in insects: a general explanation? Entomological Society of America annual meeting, Knoxville, TN.

Dillon, M.E. and M.R. Frazier. 2012. Allometric scaling of development time with body size in insects. Entomological Society of America annual meeting, Knoxville, TN.

Howard, J.R.^{UG}, Buckio, B.R.^{UG}, and M.E. Dillon. 2012. Within-nest allometry of the bumblebee tracheal system. SICB annual meeting, Charleston, SC.

Nater, O.H.A.^G, Bruno, J.R.^{UG}, and M.E. Dillon. 2012. Effects of climate on seasonal abundance of native bees and flowers – implications for plant-pollinator communities in the face of climate change. SICB annual meeting, Charleston, SC.

Bell, C.B.^{UG} and M.E. Dillon. 2012. Seasonal variation in body size of native bees: thermal constraint or resource limitation? SICB annual meeting, Charleston, S.C.

Dillon, M.E., and M.R. Frazier. 2012. Development time, seasonality, and body size clines in insects: a general explanation? SICB annual meeting, Charleston, S.C.

Frazier, M.R., and M.E. Dillon. 2012. Allometric scaling of development time in insects. SICB annual meeting, Charleston, S.C.

Wang, G., Lippert, C., Rowan, B. A., Dillon, M. E., Borgwardt, K. M., Weigel, D., and Oliver Stegle.

2011. Detecting climate signals in genomes: a GWA approach to find footprints of climate selection in the *Arabidopsis thaliana* genome using new measures of climatic variability. 13th Congress of the European Society for Evolutionary Biology, Tübingen, Germany.