**Curriculum Vitae**

**David William Inouye**

**1. Personal Information** March 2021 Professor Emeritus

Department of Biology

University of Maryland

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**2. Education**

Undergraduate: Swarthmore College

Major: Zoology

Graduate: University of North Carolina

Doctor of Philosophy, 1976

Major: Zoology

Postdoctoral: NATO Postdoctoral Fellow, 1978

Botanisches Institut der Universität Wien

University of Vienna

**3. Academic history**

1972 Organization for Tropical Studies course, Tropical Biology

1973 Teaching Assistant, O.T.S. course 73-1, Tropical Biology

1974-75 Research Assistant to Dr. Helmut C. Mueller, University of N.C.

1976-81 Assistant Professor, University of Maryland, Department of Zoology

1981 Visiting faculty member, O.T.S. course

1981-03 Associate Professor, University of Maryland, Department of Zoology (now Biology)

1982 Sabbatical semester at Rocky Mtn. Biological Laboratory

1984 Sabbatical semester at Australian Museum

1984-98 Affiliate faculty member in Department of Plant Biology, University of Maryland

1988-90 Director, Mountain Research Station, University of Colorado

1990-10 Director, graduate program in Sustainable Development and Conservation Biology

* 1. Sabbatical year at Rocky Mountain Biological Laboratory

1999-06 Affiliate faculty member, School of Public Policy, University of Maryland

2001 - Certified Senior Ecologist, Ecological Society of America

2001-02 Sabbatical year at Rocky Mountain Biological Laboratory and University of Natal, Pietermaritzburg, South Africa

2003-14 Professor, University of Maryland, Department of Biology

2010-11 Program Officer, Population and Community Ecology, National Science Foundation

2011-14 Associate Chair and Director of Graduate Studies, Department of Biology

2014-16 Lead Author for Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Fast-track assessment of pollinators, pollination and food production.

2014- Professor Emeritus, University of Maryland, Department of Biology

2014- Member, Roundtable on Public Information in the Life Sciences, National Academy of Sciences

2016 Alternate Member, federal Advisory Committee on Climate Change and Natural Resource Science (ACCCNRS)

**4. Research, Scholarly, and Creative Activities** [As of 3/23/21, Web of Science: 8,580 citations, h-index = 44; Google Scholar: 19,289 citations, h-index = 56]

Inouye, D. W. 1976. Resource partitioning and community structure: A study of bumblebees in the Colorado Rocky Mountains. Ph.D. Dissertation. University of North Carolina, Chapel Hill.

**a. Books**

1. **Books authored**

Kearns, C. A. and Inouye, D. W. 1993. Techniques for Pollination Biologists. University Press of Colorado, Niwot, CO. 583 pages. 2nd printing 1994. 3rd printing 2000. Print-on-demand as of 2012.

**ii. Chapters in books**

1. Inouye, D. W. 1977. Species structure of bumblebee communities in North America and Europe. In: The Role of Arthropods in Forest Ecosystems (Mattson, W. J., ed.) pp. 35‑40. Springer-Verlag, NY.

2. Inouye, D. W. 1983. The ecology of nectar robbing. In: The Biology of Nectaries (Elias, T. S. and Bentley, B. L., eds.) pp. 153‑173. Columbia University Press, NY.

3. Inouye, D. W. 1988. Natural variation in plant and animal populations, and its implications for studies of recovering ecosystems. In: Rehabilitating Damaged Ecosystems (Cairns, J., ed.) pp. 39-50. CRC Press, Boca Raton.

4. Kearns, C.A., Inouye, D.W., and Waser, N.M. 1998. Endangered mutualisms: The conservation biology of plant-pollinator interactions. Annual Review of Ecology and Systematics 29: 83-112.

5. Inouye, D. W. 2001. Pollinators, the role of. In: Encyclopedia of Biodiversity 4:723-730. Academic Press, San Diego.

6. Morales, M., D. W. Inouye, M. L. Leigh and G. Lowe. 2003. Considering interactions: Incorporating biotic interactions into viability assessment. Pages 267-287 in: Population Viability in Plants (C. A. Brigham and M. W. Schwartz, eds.); Ecological Studies, Volume 165. Springer-Verlag, Berlin.

7. Inouye, D. W., and F.-E. Wielgolaski. 2003. Phenology of high-altitude climates. Pages 195-214 in: Phenology: An Integrative Environmental Science (M. D. Schwartz, ed.) Kluwer Academic Publishers.

8. Wielgolaski, F.-E., and D. W. Inouye. 2003. Phenology of high-latitude climates. Pages 175-194 in: Phenology: An Integrative Environmental Science (M. D. Schwartz, ed.) Kluwer Academic Publishers.

9. Inouye, D. W. 2005. Biodiversity and ecological security. Pages 203-215 in: From Resource Scarcity to Ecological Security (D. Pirages and K. Cousins, eds.). MIT Press, Cambridge.

10. Inouye, D., and B. Barr. 2006. Consequences of abrupt climate change for hibernating animals and perennial wildflowers at high altitude in the Colorado Rocky Mountains, USA. Pages 166-168 in: Global Change in Mountain Regions (M. F. Price, ed.). Sapiens Publishing, U.K.

11.Backlund, P., A. Janetos, L. Hansen, D. Inouye, B.P. Kelly, L. Meyerson, B. Peterson, and R. Shaw. 2008. Biodiversity. Chapter 5, pp. 203-215 in: The effects of climate change on agriculture, land resources, water resources, and biodiversity. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Synthesis and Assessment Program, Product 4.3. Washington, DC. [**http://www.sap43.ucar.edu/documents/Front\_Matter.pdf**](http://www.sap43.ucar.edu/documents/Front_Matter.pdf)

12. Inouye, D. W. 2011. Reflections: Conservation of Plant-Pollinator Mutualisms. Chapter 21 (p. 237-240) in: Sammataro, D., and J. A. Yoder, Editors. Honey Bee Colony Health: Challenges and Sustainable Solutions. Taylor & Francis Group.

13. Inouye, David and Amy McKinney. 2011. Community Phenology. In Oxford Bibliographies Online: Ecology. Ed. David Gibson. New York: Oxford University Press.

14. Inouye, D. W., and F.-E. Wielgolaski. 2013. Phenology of high-altitude climates. Pages 249-272 in: Phenology: An Integrative Environmental Science (M. D. Schwartz, ed.) Kluwer Academic Publishers.

15. Wielgolaski, F.-E., and D. W. Inouye. 2013. Phenology of high-latitude climates. Pages 225-247 in: Phenology: An Integrative Environmental Science (M. D. Schwartz, ed.) Kluwer Academic Publishers.

16. Inouye, D. W. 2013. Pollinators, Role of. Encyclopedia of Biodiversity, 2nd edition. S. A. Levin. Waltham, MA, Academic Press. **6:** 140-146.

17. Chapin, F. S. III, S. T. A. Pickett, M. E. Power, S. L. Collins, J. S. Baron, D. W. Inouye, and M. G. Turner. 2015. Earth Stewardship: An Initiative by the Ecological Society of America to Foster Engagement to Sustain Planet Earth. Volume 2, pages 173-194 in: Earth Stewardship. R. Rozzi, F. S. Chapin III, J. B. Callicott et al., Springer International Publishing.

18. Inouye, D. W. Diptera as Crop Pollinators. 2018. Chapter 12, pages 30-37 in: Roubik, D. W., editor. The Pollination of Cultivated Plants, Volume 2. FAO, Rome.

19. Inouye, D. W. 2019. Case Study: Climate Change and Frost Effects in Rocky Mountain Plant Communities. Pages 234-237 in: Biodiversity and Climate Change, T. E. Lovejoy and L. Hannah, eds. Yale University Press.

20. Inouye, D. W. 2019. Climate change in other taxa and links to bird studies. Chapter 20, pp. 257-265 in: Dunn, Peter, and Anders Møller, Editors. Effects of Climate Change on Birds. Oxford University Press.

21. Rader, R., S. A. Cunningham, B. Howlett, and D. W. Inouye. 2020. Non-bee pollination of crops: Biology, ecology and management. Annual Review of Entomology 65: 391-407.

**b. Articles in Refereed Journals**

1. Inouye, D. W. 1975. Flight temperatures of male euglossine bees (Hymenoptera: Apidae: Euglossini). Journal of the Kansas Entomological Society 48:366-370.

2. Inouye, D. W. 1978. Resource partitioning in bumblebees: Experimental studies of foraging behavior. Ecology 59:672-678.

3. Inouye, D. W. and O. R. Taylor. 1979. A temperate region plant-ant-seed predator system: Consequences of extrafloral nectar secretion by *Helianthella quinquenervis*. Ecology 60:1-7.

4. Inouye, D. W. 1980. The effect of proboscis and corolla tube lengths on patterns and rates of flower visitation by bumblebees. Oecologia 45:197-201.

5. Inouye, D. W., N. D. Favre, J. A. Lanum, D. M. Levine, J. B. Meyers, F. C. Roberts, F. C. Tsao, and Y. Wang. 1980. The effects of nonsugar nectar constituents on nectar energy content. Ecology 61:992-996.

6.Inouye, D. W. and O. R. Taylor. 1980. Variation in generation time in *Frasera speciosa* (Gentianaceae), a long-lived perennial monocarp. Oecologia 47:171-174.

7. Inouye, D. W. 1982. The consequences of herbivory: a mixed blessing for *Jurinea mollis* (Asteraceae). Oikos 39:269-272.

8. Calder, W. A., S. M. Hiebert, N. M. Waser, D. W. Inouye and S. J. Miller. 1983. Site fidelity, longevity, and population dynamics of Broad-tailed Hummingbirds: a ten year study. Oecologia 56:689-700.

9. Miller, S. J. and D. W. Inouye. 1983. Roles of the wing whistle in the territorial behaviour of male Broad-tailed Hummingbirds (*Selasphorus platycercus*). Animal Behaviour 31:689-700.

10. Inouye, D. W. and G. D. Waller. 1984. Responses of honeybees (*Apis mellifera*) to amino acid solutions mimicking nectars. Ecology 65:618-625.

11. Taylor, O. R. and D. W. Inouye. 1985. Synchrony and periodicity of flowering in *Frasera speciosa* (Gentianaceae). Ecology 66:521-527.

12. Kondo, K., D. W. Inouye, M. Segawa, and T. Seki. 1986. A demographic analysis of mortality caused by *Bursaphelenchus xylophilus* and *Monochamus alternatus* in pine forests in the Seto Inland Sea-side, Japan. Oecologia 68:321-326.

13. Inouye, D. W. 1986. Long-term preformation of leaves and inflorescences by a long-lived perennial monocarp, *Frasera speciosa*, Gentianaceae. American Journal of Botany 73:1535-1540.

14. Ruff, M. S., D. T. Krizek, R. M. Mirecki and D. W. Inouye. 1987. Restricted root zone volume - impact on growth and development of tomato (*Lycopersicon esculentum* Mill.). Journal of the American Society for Horticultural Science 112:763-769.

15. Bigwood, D. W. and D. W. Inouye. 1988. Spatial distribution of the component species in an old field seed bank, and a comparison of sampling techniques. Ecology 69:497-507.

16. Inouye, D. W., and G. H. Pyke. 1988. Pollination biology in the Snowy Mts. of Australia, with comparisons with montane Colorado, U.S.A. Australian Journal of Ecology 13:191-210. Data are now part of an NCEAS working group’s compilation of network data.

17. Inouye, D. W., W. A. Calder and N. M. Waser. 1991. The effect of floral abundance on feeder censuses of hummingbird populations. Condor 93:279-285.

18. Inouye, D. W. and A. D. McGuire. 1991. Effects of snowpack on the timing and abundance of flowering in *Delphinium nelsonii*: implications for climate change. American Journal of Botany 78(7):997-1001.

19. Primack, R. B., and D. W. Inouye. 1993. Factors affecting pollinator visitation rates: a biogeographic comparison. Current Science 65(3):257-262.

20. Kearns, C. A., and D. W. Inouye. 1994. Fly pollination of *Linum lewisii* (Linaceae). American Journal of Botany 81(9):1091-1095.

21. Inouye, D. W., D. E. Gill, M. R. Dudash, and C. B. Fenster. 1994. A model and lexicon for pollen fate. American Journal of Botany 81(12):1517-1530.

22. Roubik, D. W., D. Yanega, M. Aluja, S. L. Buchmann, and D. W. Inouye. 1995. On optimal nectar foraging by some tropical bees (Hymenoptera: Apidae). Apidologie 26(3):197-211.

23. Kearns, C. A., and D. W. Inouye. 1997. Pollinators, flowering plants, and conservation biology. BioScience 47(5):297-307.

24. Allen-Wardell, G., P. Bernhardt, R. Bitner, A. Burquez, S. Buchmann, J. Cane, P. A. Cox, V. Dalton, P. Feinsinger, M. Ingram, D. W. Inouye, C. E. Jones, K. Kennedy, P. Kevan, H. Koopowitz, R. Medellin, S. Medellin-Morales, G. P. Nabhan, B. Pavlik, V. Tepedino, P. Torchio, and S. Walker. 1998. The potential consequences of pollinator declines on the conservation of biodiversity and stability of food crop yields. Conservation Biology 12(1):8-17. [This was the first paper in a new series of Commissioned Papers by the Society for Conservation Biology.]

25. Inouye, D. W., W. A. Barr, K. B. Armitage, and B. D. Inouye. 2000. Climate change is affecting altitudinal migrants and hibernating species. Proceedings of the National Academy of Sciences 97(4): 1630-1633.

26. Maloof, J. E., and D. W. Inouye. 2000. Are nectar robbers cheaters or mutualists? Ecology 81(10):2651-2661.

27. Inouye, D. W. 2000. The ecological and evolutionary significance of frost in the context of climate change. Ecology Letters 3(5):457-463.

28. Larson, B., P. G. Kevan, and D. W. Inouye. 2001. Flies and flowers: taxonomic diversity of anthophiles and pollinators. Canadian Entomologist 133:439-465.

29. Inouye, D. W., M. A. Morales, and G. J. Dodge. 2002. Variation in timing and abundance of flowering by *Delphinium barbeyi* Huth (Ranunculaceae): the roles of snowpack, frost, and La Niña, in the context of climate change. Oecologia 130: 543-550.

30. Inouye, D. W., F. Saavedra, and W. Lee-Yang. 2003. Environmental influences on the phenology and abundance of flowering by *Androsace septentrionalis* L. (Primulaceae). American Journal of Botany 90(6):905-910.

31. Saavedra, F., D. W. Inouye, M. V. Price and J. Harte. 2003. Changes in flowering and abundance of *Delphinium nuttallianum* (Ranunculaceae) in response to a subalpine climate warming experiment. Global Change Biology 9: 885-894.

32. Inouye, D. W., and C. Brewer. 2003. A case study of the program in Sustainable Development and Conservation Biology at the University of Maryland. Conservation Biology **17**:1204-1208.

33. Wangchuk, T., M. Hare, and D. W. Inouye, 2003. A new subspecies of Golden Langur (*Trachypithecus geei*) from Bhutan. *Folia Primatologica* 74(2): 104-108.

34. Morales, M. A., G. J. Dodge, and D. W. Inouye. 2005. A phenological mid-domain effect in flowering diversity. Oecologia 142(1): 83-89.

35. Betancourt, J. L., M. D. Schwartz, D. D. Breshears, D. R. Cayan, M. D. Dettinger, D. W. Inouye, E. Post, and B. C. Reed. 2005. Implementing a USA-National Phenology Network (USA-NPN). EOS 86(51): 539-542.

36. National Research Council of the National Academies.  2007.  Status of Pollinators in North America.  National Academies Press, Washington, D.C. [member of the committee that wrote the report]

37. Lambrecht, S., M. E. Loik, D. W. Inouye, and J. Harte. 2007. Carbon costs of reproduction under experimental warming in a subalpine meadow. New Phytologist 173: 121-134.

38. Inouye, D. W. 2007. Impacts of global warming on pollinators. Wings 30(2): 24-27.

39. Inouye, D. W. 2008. Effects of climate change on phenology, frost damage, and floral abundance of montane wildflowers. Ecology 89(2): 353-362. [Rated “Recommended” by Faculty of 1000]

40. Post, E., and D. W. Inouye. 2008. Phenology: response, driver, and integrator. (Introduction to Special Feature). Ecology 89(2): 319-320.

41. Miller-Rushing, A. J., D. W. Inouye, and R. B. Primack. 2008. How well do first flowering dates measure plant responses to climate change? The effects of population size and sampling frequency. Journal of Ecology 96: 1289-1296.

42. Wangchuk, T., D. Inouye, and M. Hare. 2008. The emergence of an endangered species: Evolution and phylogeny of the *Trachypithecus geei* of Bhutan. International Journal of Primatology **29**:565-582.

43. White, M. A., de Beurs, K. M., Didan, K., D. W. Inouye, A. D. Richardson, O. P. Jensen, J. Magnuson, J. O’Keefe, G. Zhang, R. R. Nemani, W. J. D. van Leeuwen, J. F. Brown, A. de Wit, M. Schaepman, X. Lin, M. Dettinger, A. Bailey, J. Kimball, M. D. Schwartz, D. D. Baldocchi, and W. K. Lauenroth. 2009. Intercomparison, interpretation, and assessment of spring phenology in North America estimated from remote sensing for 1982 to 2006. Global Change Biology 15(10):2335-2359.

44. Miller-Rushing, A. J. and D. W. Inouye. 2009. Variation in the impact of climate change on flowering phenology and abundance: An examination of two pairs of closely related wildflower species. American Journal of Botany 96:1821-1829.

45. Forrest, J., D. W. Inouye, and J. D. Thomson. 2010. Flowering phenology in subalpine communities: Does climate variation reshuffle species assemblages? Ecology 91(2):431-440.

46. Lambert, A., A. J. Miller-Rushing, and D. W. Inouye. 2010. Changes in snowmelt date and summer precipitation affect the flowering phenology of *Erythronium grandiflorum* Pursh (glacier lily, Liliaceae). American Journal of Botany 97(9): 1431–1437.

47. Miller-Rushing, A. J., Toke T. Høye, D. W. Inouye, and E. Post. 2010. The effects of phenological mismatch on demography. Philosophical Transactions of the Royal Society B 365: 3177-3186.

48. Inouye, D. W. 2010. Correspondence: Mosquitoes: more likely nectar thieves than pollinators. Nature 467: 27.

49. Inouye, D. W. 2010. Correspondence: Returning fire against ‘cheap shots’ at research projects. Nature 467: 400.

50. Aldridge, G., D. W. Inouye, J. R. K. Forrest, W. A. Barr, and A. J. Miller-Rushing. 2011. Emergence of a mid-season period of low floral resources in a montane meadow ecosystem associated with climate change. Journal of Ecology 99(4): 905-913.

51. Pyke, G. H., D. W. Inouye, and J. Thomson. 2011. Activity and abundance of bumble bees near Crested Butte, Colorado: Diel, seasonal and elevation effects. Ecological Entomology 36:511-521.

52. Che-Castaldo, J. P., and D. W. Inouye. 2011. The effects of dataset length and mast seeding on the demography of *Frasera speciosa,* a long-lived monocarpic plant. Ecosphere 2011 2:11, art126, 18 p.

53. Inouye, D. W. 2011. Effects of frost on wildflowers: an unexpected consequence of climate change. EcoEd Digital Library <http://ecoed.esa.org/> [collection of 22 photographs and graphs]

54. Boggs, C. L., and D. W. Inouye. 2012. A single climate driver has direct and indirect effects on pollinator numbers. Ecology Letters 15(5):502-508. [Rated “must read” by Faculty of 1000]

55. Diez, J. M., A. J. Miller-Rushing, S. J. Mazer, T. M. Crimmins, M. A. Crimmins, C. D. Bertelsen, and D. W. Inouye. 2012. Forecasting phenology: from species variability to community forecasts. Ecology Letters 15: 545-553.

56. Anderson, J. T., D. W. Inouye, A. McKinney, and T. Mitchell-Olds. 2012. Phenotypic plasticity and adaptive evolution contribute to advancing flowering phenology in response to climate change. Philosophical Transactions of the Royal Society 279(1743): 3843-3852. [Rated “must read” by Faculty of 1000]

57. McKinney, A. M., P. J. CaraDonna, D. W. Inouye, b. barr, D. Bertelson, and N. M. Waser. 2012. Asynchronous changes in phenology of migrating Broad-tailed Hummingbirds and their early-season nectar resources. Ecology 93(9):1987-1993.

58. Ezenwa, V. O., N. M. Gerardo, D. W. Inouye, M. Medina, and J. B. Xavier. 2012. The animal microbiome – a hidden dimension of animal behavior. Science (Perspective paper) 338: 198-199.

59. Pyke, G. H., D. W. Inouye, and J. D. Thomson. 2012. Local geographic distributions of bumble bees near Crested Butte, Colorado: Competition and community structure revisited. Environmental Entomology 41(6):1332-49.

60. Iler, A. M., and D. W. Inouye. 2013. Effects of climate change on mast-flowering cues in a clonal montane herb, *Veratrum tenuipetalum* (Melanthiaceae). Amer. J. Bot. 100:1-7.

61. Iler, A. M., T. T. Høye, D. W. Inouye, and N. M. Schmidt. 2013. Long-term trends mask variation in the direction and magnitude of short-term phenological shifts. Amer. J. Bot. 100(7):1398-1406.

62. Iler, A. M., T. T. Høye, D. W. Inouye, and N. M. Schmidt. 2013. Nonlinear flowering responses to climate: Are species approaching their limits of phenological change? Philosophical Transactions of the Royal Society, themed issue 368: 20120489

63. Mazer, S. J., S. E. Travers, B. I. Cook, T. J. Davies, K. Bolmgren, N. J. B. Kraft, N. Salamin, and D. W. Inouye. 2013. Flowering date of taxonomic families predicts phenological sensitivity to temperature: Implications for forecasting the effects of climate change on unstudied taxa. Amer. J. Bot. 100(7):1381-1397.

64. Iler, A. M., D. W. Inouye, T. T. Høye, A. J. Miller-Rushing, L. A. Burkle, and E. Johnston. 2013. Maintenance of temporal synchrony between syrphid flies and their floral resources despite differential phenological responses to climate. Global Change Biology 19(8):2348–2359.

65. Zhang, Yan-Wen, Ji-Min Zhao, and D. W. Inouye. 2014. Nectar thieves influence reproductive fitness by altering behavior of nectar robbers and legitimate pollinators in Corydalis ambigua (Fumariaceae). Journal of Ecology 102(1):229–237.

66. Woodcock, T., B. M. H. Larson, P. G. Kevan, D. W. Inouye, and K. Lunau. 2014. Flies and flowers II: Floral attractants and rewards. Journal of Pollination Ecology 12(8):63-94.

67. Che-Castaldo, J. P., and D. W. Inouye. 2014. Field germination and survival of experimentally introduced metal hyperaccumulator *Noccaea caerulescens* (Brassicaceae) across a soil metal gradient. American Midland Naturalist 171(2): 229-245.

68. CaraDonna, P. J., A. M. Iler, and D. W. Inouye. 2014. Shifts in flowering phenology reshape a subalpine plant community. Proc. Nat. Acad. Sci. (USA) 111(13): 4916-4921. [Recommended by Faculty of 1000]

69. Fagan, W. F., S. Bewick, S. Cantrell, C. Cosner, I. G. Varassin, and D. W. Inouye. 2014. Phenologically explicit models for studying plant-pollinator interactions under climate change. Theoretical Ecology 7:289-297.

70. Wright, Karen W., K. L. Vanderbilt, D. W. Inouye, C. D. Bertelsen, and T. M. Crimmins. 2015. Turnover and reliability of flower communities in extreme environments: Insights from long-term phenology data sets. Journal of Arid Environments 115:27-34.

71. CaraDonna, P. J. and D. W. Inouye. 2015. Phenological responses to climate change do not exhibit phylogenetic signal in a subalpine plant community. Ecology 96(2):355-361.

72. Che-Castaldo, J. and D. W. Inouye. 2015. Interspecific competition between a non-native metal-hyperaccumulating plant (*Noccaea caerulescens*, Brassicaceae) and a native congener across a soil-metal gradient. Australian Journal of Botany 63(2):141-151.

73. Gezon, Z. J., E. S. Wyman, J. S. Ascher, D. W. Inouye, and R. E. Irwin. 2015. The effect of repeated, lethal sampling on wild bee abundance and diversity. Methods in Ecology and Evolution 6(9):1044-1054.

74. Chen, X., S. An, D. Inouye, and M. Schwartz. 2015. Temperature and snowfall trigger alpine vegetation green-up on the world's roof. Global Change Biology 31(10):3635-3646.

75. Inouye, D. W., B. M. H. Larson, and P. G. Kevan. 2015. Flies and flowers III: Ecology of foraging and pollination. Journal of Pollination Ecology 16. http://www.pollinationecology.org/index.php?journal=jpe&page=article&op=view&path%5B%5D=333

76. Pyke, G. H., J. D. Thomson, D. W. Inouye and T. J. Miller. 2016. Effects of climate change on phenologies and distributions of bumble bees and the plants they visit. Ecosphere 7(3): DOI 10.1002/ecs2.1267

77. Gezon, Z. J., D. W. Inouye, and R. E. Irwin. 2016. Phenological change: implications for pollination and plant fitness. Global Change Biology 22(5): 1779-1793.

78. Petry, W. K., J. D. Soule, A. M. Iler, Ana Chicas-Mosier, D. W. Inouye, T. E. X. Miller, K. A. Mooney. 2016. Sex-specific responses to climate change drive rapid shifts in population sex ratio. Science 353: 69-71.

79. Compagnoni, A., Andrew J. Bibian, Brad M. Ochocki, Haldre S. Rogers, Emily L. Schultz, Michelle E. Sneck, Bret D. Elderd, Amy M. Iler, David W. Inouye, Hans Jacquemyn, and Tom E. X. Miller. 2016. The effect of demographic correlations on the stochastic population dynamics of perennial plants. Ecological Monographs 86: 480–494.

80. Meng, Fandong, Yang Zhou, Shiping Wang, Jichuang Duan, Zhenhua Zhang, Haishan Niu, Lili Jiang, Shujuan Cui, Xin’e Li, Caiyun Luo, Lrirong Zhang, Qi Wang, Xiaoying Bao, Tsechoe Dorji, Yingnian Li, Mingyuan Du, Xinquan Zhao, Liang Zhao, Guojie Wang and David W. Inouye. 2016. Temperature sensitivity thresholds to warming and cooling in phenophases of alpine plants. Climatic Change 139:579–590.

81. de Keyzer, C. W., N. E. Rafferty, D. W. Inouye, and J. D. Thomson. 2017. Confounding effects of spatial variation on temporal shifts in phenology. Global Change Biology 23(5):1783-1791. DOI: 10.1111/gcb.13472

82. Iler, A. M., D. W. Inouye, N. M. Schmidt, T. T. Høye. 2017. Detrending phenological time series improves climate-phenology analyses and reveals evidence of plasticity. Ecology 98(3):647-655.

83. Chen, Xiaoqiu, Lingxiao Wang, and D. W. Inouye. 2017. Delayed response of spring phenology to global warming in subtropics and tropics. Agricultural and Forest Meteorology 234-235:222-235.

84. Ye, Zhong-Ming, Xiao-Fang Jin, Qing-Feng Wang, Chun-Feng Yang, and D. W. Inouye. 2017. Nectar replenishment maintains the neutral effects of nectar robbing on female reproductive success of *Salvia przewalskii* (Lamiaceae), a plant pollinated and robbed by bumble bees. *Ann Bot*. 119(6): 1053-1059.

85. Pardee, G., D. W. Inouye, and R. E. Irwin. 2017. Direct and indirect effects of episodic frost on plant growth and reproduction in subalpine wildflowers. Global Change Biology 24(2):848-857.

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94. Aizen, Marcelo A., Cecilia Smith-Ramirez, Carolina I. Morales, Lorena Vieli, Agustin Sáez, Rodrigo M. Barahona-Segovia, Marina P. Arbetman, José Montalva, Lucas A. Garibaldi, David W. Inouye, and Lawrence D. Harder. 2019. Coordinated global species-importation policies are needed to reduce the sting of serious invasions: the case of alien bumble bees in South America. Journal of Applied Ecology 56: 100-106.

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**c. Notes and Editorials in Refereed Journals**

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10. Inouye, D. W. 2001. Pollinator corridors. Conservation Biology in Practice 2(3):3-4.

11. Inouye, D. W. 2007. The value of bees. Biological Conservation 140:198-199.

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**e. Book Reviews, Other Articles, and Notes**

1. **Book reviews**

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Inouye, D. W. 1989. An Evolutionary Basis for Pollination Ecology; S. C. Willemstein. Evolution: 43:1573-74.

Inouye, D. W. 1995. Endress, P. K. 1994. Diversity and Evolutionary Biology of Tropical Flowers. New Phytologist 130(2):323-324.

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Inouye, D. W. 2012. Rotheray, G. E., and F. Gilbert. 2011. The Natural History of Hoverflies. Forest Text, Ceredigion, UK. Ecology 93(5):1243-44.

Inouye, D. W. 2017. Insiders’ perspectives on the Long-Term Ecological Research program. Willig, Michael R., and Lawrence R. Walker, editors. 2016. *Long-term ecological research. Changing the nature of scientists.* Ecology 98(5):1480-1482.

1. **Software and other reviews**

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Inouye, D. W. 1986. Technological tools - Quick and easy graphics; BITNET. Bulletin of the Ecological Society of America 67:191-193.

Inouye, D. W. 1987. Technological tools - NSFnet, CoStat. Bulletin of the Ecological Society of America 68:50.

Inouye, D. W. 1987. Technological tools - Curve Fitter-PC, Scientific Plotter-PC, GraphStation. Bulletin of the Ecological Society of America 68:173-184.

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Inouye, D. W. 1987. Technological tools - PlotIT. Bulletin of the Ecological Society of America 68:525-526.

Inouye, D. W. 1988. Technological tools - Scimate, Grammatik. Bulletin of the Ecological Society of America 69:44-48.

Inouye, D. W. 1988. Technological tools - StatGraphics. Bulletin of the Ecological Society of America 69:123-124.

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Inouye, D. W. 1990. Technological Tools - Magellan, etc. Bulletin of the Ecological Society of America 71(1): 37-40.

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Inouye, D. W. 1991. Technological Tools - Paintbrush. Bulletin of the Ecological Society of America 72(3):186.

Inouye, D. W. 1991. Technological Tools - MathType, SigmaPlot. Bulletin of the Ecological Society of America 72(4):244-245.

Inouye, D. W. 1992. Technological Tools - Memory Management. Bulletin of the Ecological Society of America 73(1):73-74.

Inouye, D. W. 1992. Technological Tools - WordStar, DECA. Bulletin of the Ecological Society of America 73(3):185-186.

Inouye, D. W. 1992. Technological Tools - Papyrus. Bulletin of the Ecological Society of America 73(4):279-280.

Inouye, D. W. 1993. Technological Tools - Stacker 3.0. Bulletin of the Ecological Society of America 74(1):60-61.

Inouye, D. W. 1994. Technological Tools - OS/2, ESA Database. Bulletin of the Ecological Society of America 75(1):17-18.

Inouye, D. W. 1994. Technological Tools - Weather data and pictures by e-mail; Bar codes and field work. Bulletin of the Ecological Society of America 75(2):85-86.

Inouye, D. W. 1994. Technological Tools - RAMAS models. Bulletin of the Ecological Society of America 75(4):266-267.

Inouye, D. W. 1995. Technological Tools - MathCad, Nemesis. Bulletin of the Ecological Society of America 76(1):38-40.

Inouye, D. W. 1995. Technological Tools - OS/2 Warp, WinFax Pro 4.0. Bulletin of the Ecological Society of America 76(2):84-85.

Inouye, D. W. 1995. Technological Tools - Stacker 4.0 for OS/2 and DOS. Bulletin of the Ecological Society of America 76(3):140.

Inouye, D. W. 1996. Technological Tools - PC-ORD, EcoFile. Bulletin of the Ecological Society of America 77(1):26-27.

Inouye, D. W. 1996. Technological Tools - Biopak. PartitionMagic. Bulletin of the Ecological Society of America 77(2):84-85.

Inouye, D. W. 1996. Technological Tools - System Commander 2.2. Bulletin of the Ecological Society of America 77(3):149.

Inouye, D. W. 1997. Technological Tools - DragonDictate 2.0; That synching feeling; recycling computers and disks. Bulletin of the Ecological Society of America 78(2):139-141.

Inouye, D. W. 1997. Technological Tools - Biota: the biodiversity database manager. Ecology 78(8):2641-2642.

Inouye, D. W. 1998. Technological Tools - File transfers and remote control. Bulletin of the Ecological Society of America 79(3):189-190.

Inouye, D. W. 1998. Technological Tools - Electronic libraries and databases. Bulletin of the Ecological Society of America 79(3):190-191.

Inouye, D. W. 1998. Technological Tools - Internet map and satellite image resources; EndNote update. Bulletin of the Ecological Society of America 79(4):236-237.

Inouye, D. W. 2000. Technological Tools - SigmaPlot for Windows, v. 5.05. Bulletin of the Ecological Society of America 81(1):73-74.

Inouye, D. W. 2000. Technological Tools - EndNote 4.0. Bulletin of the Ecological Society of America 81(4):274.

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Inouye, D. W. 2003. Technological Tools – EndNote 6.0. Bulletin of the Ecological Society of America.

Inouye, D. W. 2004. Homebrew camera traps. Bulletin of the Ecological Society of America 85(3):104.

1. **Other articles**

Holland, M. M., D. M. Lawrence, D. J. Morin, C. Hunsaker, D. Inouye, A. Janetos, H. R. Pulliam, W. Robertson, and J. Wilson. 1992. Profiles of ecologists: Results of a survey of the membership of the Ecological Society of America. The Ecological Society of America.

Inouye, D. W. 1971. Candlemaking. Page 159 in The Last Whole Earth Catalog. The Portola Institute.

Inouye, D. W. 1984. Ants and the aspen sunflower. Natural History 93:48-53.

Inouye, D. W. 1985. Spider fishing in the Snowy Mountains. Australian Natural History 21:388-389.

Inouye, D. W. 1986. Portrait of a mountain meadow. Orion Nature Quarterly 5(3):18-25.

Inouye, D. W. 1998. Bees not yet extinct in the U.K. Letter to the Editor. World Watch magazine 11(3):6-7.

Inouye, D. W. 2000. Heat futures: the Colorado Rocky Mountains. Earthwatch magazine 19(4):30.

Kearns, C. A., and D. W. Inouye. 1993. Pistil-packing flies. Natural History 102(4):30-37.

Tracy, C. R. and D. W. Inouye. 1983. QuickStat (A statistical package for use with Apple II Computers).

Winter, K., L. Adams, R. Thorp, D. Inouye, L. Day, J. Ascher, and S. Buchmann. 2006. Importation of non-native bumble bees into North America: Potential consequences of using *Bombus terrestris* and other non-native bumble bees for greenhouse crop pollination in Canada, Mexico, and the United States. A White Paper of the North American Pollinator Protection Campaign (NAPPC). http://www.pollinator.org/Resources/BEEIMPORTATION\_AUG2006.pdf

Inouye, D. W. 2007. In celebration of pollinators. Crested Butte News. 22 June: 53-54.

Inouye, D. W. 2007. Dash, doze or disappear. Animal strategies for coping with thirty-six feet of snow. Crested Butte Magazine 29(2):90-96.

Inouye, D. W. 2008. Whistling while they work. Crested Butte Magazine 30(1):27.

Price, M., N. Waser, D. Blumstein, D. Inouye, B. Castro-Escobar, and R. Furman. 2013. Coyotes and columbines: Do predators deter deer from eating Colorado native wildflowers? Aquilegia 35(5) 3-5.

Inouye, D. W. 2015. Where did he spend the night? Crested Butte Magazine 37: 42-48.

Inouye, D. W. Phenology dataset permission Open Science Framework, at <https://osf.io/jt4n5/>

**f.** **Talks, Abstracts, and Other Professional Papers Presented**

1. **Invited talks, etc.**

1978 Botanisches Institut, University of Vienna; University of Bayreuth

1979 Princeton University; University of Colorado; Virginia Polytechnic Institute and S. U.

1980 Rocky Mtn. Biological Laboratory; Smithsonian Tropical Research Institute; University of California, Irvine; University of California, Riverside; University of California, Santa Barbara; University of Maryland

1981 U.S.D.A. Bee Research Center, Tucson; University of Minnesota Lake Itasca Forestry and Biological Station; Georgetown University

1982 George Mason University; Colorado State University; University of Utah; University of Colorado; University of California, Irvine

1983 Earthwatch; Toyama University; Kyoto University; Hiroshima University; Swarthmore College; University of Pennsylvania

1984 Duke University; Flinders University of South Australia; Monash University; Ohio State University; Stanford University; University of California, Berkeley; University of Hawaii; University of Maryland (Botany); University of Melbourne; University of North Carolina

1985 Rocky Mtn. Biological Lab; Rutgers University

1986 University of Delaware

1987 Rocky Mtn. Biological Lab; U. S. National Arboretum; University of Maryland (Botany)

1988 Audubon Society; Colorado College; Colorado State University; Earthwatch; Swarthmore College; University of Colorado

1989 Earthwatch; University of Colorado; University of Missouri-St. Louis; University of Utah; Wellesley College

1990 Earthwatch; Idaho State University; Keystone Science Center; Ohio University; University of Dayton; University of Nebraska; University of Virginia; University of Denver

1991 Rocky Mountain Biological Laboratory

1994 National Zoological Park; University of Kansas; Smithsonian Institution's Biodiversity Monitoring course; Skidmore College; Colorado State University

1995 Florida International University; Georgetown University; Trenton State College; Western State College

1996 Natural History Society of Maryland; Truman State University; William Paterson College

1. University of Paris (Orsay); Earthwatch Europe (Oxford); Smithsonian Institution's Environmental Research Center; University of Richmond
2. Denver Natural History Museum; University at Albany (SUNY)
3. University at Albany (SUNY)
4. National Zoological Park; Rocky Mountain Biological Laboratory; University of British Columbia; University of South Dakota
5. Joint Global Change Research Institute (Univ. of MD), University of California – Davis, University of North Dakota; University of Seville; University of Utah
6. University of Natal, Pietermaritzburg; Imperial College at Silwood Park
7. Boston University
8. Rocky Mountain Biological Laboratory; United States Botanic Garden (2 presentations); United States National Arboretum
9. University of Oregon; Willamette University
10. University of California, Irvine
11. Florida State University; University of Arkansas; University of Kansas (selected by the graduate students in Ecology and Evolutionary Biology as their invited speaker); University of Maryland (Geography Department)

2009 Invited speaker, 13th Symposium on Natural History of Lower Tennessee and Cumberland River Valleys, The Center Excellence for Field Biology at Austin Peay State University; National Science Foundation; Western State College; Invited speaker, Climate Change Adaptation Workshop for Natural Resource Managers in the Gunnison Basin, organized by The Nature Conservancy’s Southwest Climate Change Initiative.

2010 Jane and Whitney Harris Lecture at the Missouri Botanical Garden; Paul Buck Annual Lecture at the University of Tulsa; Whitney R. Harris World Ecology Center 20th anniversary lecture (University of Missouri, St. Louis); The Wildlife Society (symposium speaker); Utah State University (selected by graduate students as their invited speaker); IUCN North American Bumble Bee Species Conservation Strategy Workshop

2011 George Washington University; University of Colorado (invited by graduate students); Pennsylvania State University (invited by graduate students); Energy Future Coalition; National Science Foundation; Rocky Mountain Biological Laboratory; Workshop on alpine research in the Northeast United States; South Korean Ministry of Environment; Stockholm University; Swedish University of Agricultural Sciences; Universidad Nacional de Colombia; University of Vermont; Western State College; World Wildlife Fund – Sweden

2012 8th annual Harvard Plant Biology Symposium (Plant Reproductive Biology: Genomics to Phenomics); Changchun Normal University (China); Northeast Normal University (China); Aarhus University (Denmark)

2013 University of Arizona; National Institute of Ecology (Korea); West Virginia University

2014 University of Texas (Austin); University of Toronto; Ecological Society of Japan (Special Guest); Wuhan Botanic Garden; International Bamboo and Rattan Center; Peking University; Changchun Normal University; Chinese Academy of Forestry.

2015 University of California, Berkeley; Plenary talk at the Mexican Ecological Society; New Mexico Native Plant Society; Two invited symposium talks and a plenary talk at the European Ecological Federation meeting (Rome)

2016 Keynote speech, conference on Stressors and Drivers of Food Security: Evidence from Scientific Collections (Beltsville, MD). Plenary talk, Guild of Rocky Mountain Ecologists and Evolutionary Biologists (Rocky Mtn. Biological Lab); Webinar presentation for Bee City USA; Carleton University

2017 FAO-IPCC Expert Meeting on Climate Change, Land Use and Food Security - FAO Rome (invited speaker); Keynote speaker, International Conference on Sustainable Agriculture and Bioeconomy, Bangkok; Betty Ford Alpine Garden; Rocky Mountain Biological Laboratory; SUNY Oneonta (Cornell-Gladstone-Hanlon-Kaufmann lecture); Michigan State University (LTER all-scientist meeting, Kellogg Biological Station)

2018 Plenary lecture, XI International Symposium on Pollination, International Commission for Plant-Pollinator Relationships (Berlin); Invited lecture, MtClim 2018; Invited talk, Colorado Section of the Society for Range Management

2019 University of Tennessee; Invited talks, Colorado Native Plant Society, Colorado Chapter of The Wildlife Society

2020 Kyoto University; Denver Botanic Garden (remote); Tyson Research Center (remote); Betty Ford Alpine Garden (remote); AAAS Climate Justice Symposium (remote); Northwest Center for Alternatives to Pesticides (NCAP) and Pesticide Action Network (PAN), webinar in the Protecting Migratory Pollinators series; keynote talk for North American Pollinator Protection Campaign; guest lecture for ecology class at UNM-Taos; guest lecture for Rocky Mountain Biological Laboratory; [Colorado Pollinator Summit](https://www.youtube.com/playlist?list=PLwM0k-pO0OfZokkPEbpAZZvg6cP2eHTmX)

1. **Contributed talks, etc.**

1978 4th International Symposium on Pollination

1979 Ecological Society of America; Guild of Rocky Mountain Population Biologists; Society for the Study of Evolution; Symposium, Population biology of monocarpic perennials, Botanical Society of America

1980 Society of America Eastern Branch, Entomological Society of America; Ecological Society of America; Guild of Rocky Mountain Population Biologists; Symposium, Pollination behavior and biology, Eastern Branch, Entomological Society of America; Guild of Rocky Mountain Population Biologists

1990 Southwestern Area Regional Meeting, AAAS

1981 Symposium, Plant population biology: A modern synthesis, XIII International Botanical Congress; Guild of Rocky Mountain Population Biologists

1982 Symposium, Long-lived perennial herbs - population dynamics and species interactions, Ecological Society of America; Botanical Society of America; Guild of Rocky Mountain Population Biologists

1983 Guild of Rocky Mountain Population Biologists

1984 Society for the Study of Evolution; Society of American Naturalists; Ecological Society of America

1985 Population Biologists of New England

1987 Ecological Society of America and Botanical Society of America; Symposium, Ant/Plant Interactions, Association for Tropical Biology

1988 Ecological Society of America; Botanical Society of America; Guild of Rocky Mountain Population Biologists

1989 Ecological Society of America; Botanical Symposium, Global patterns of ant-plant mutualism and the influencing ecological factors, XI International Congress of the International Union for the Study of Social Insects (co-author with Dr. O. R. Taylor)

1991 Guild of Rocky Mountain Population Biologists; Ecological Society of America

1993 Society of America; Botanical Society of America

1995 Ecological Society of America

1. Ecological Society of America (2 talks)

1999 First Colombian Congress of Botany, Bogota (invited roundtable presentation)

Society for Conservation Biology; Ecological Society of America (co-organizer of symposium: Conflicts, cooperation, and costs: disruption and control of diverse mutualisms)

1. AAAS symposium **(**Ecosystem Services: A Free Lunch?);Joint meeting of the British Ecological Society and the Ecological Society of America; Society for Conservation Biology; Ecological Society of America (author or co-author of 6 presentations); Guild of Rocky Mountain Population Biologists (invited speaker); Clone~2000, Current progress & developments in clonal plant research; ”Progress in phenology – Monitoring, data analysis, and global change impacts”; Wildlife Habitat Council (keynote speaker at annual meeting); Globalization and Ecological Security (conference at the Woodrow Wilson Center)
2. Invited participant in workshop of the Committee on the Science and Policy Implications of Abrupt Climate Change of the National Research Council. Wildlife Society symposium, Research and Management Concerns for Alpine Ecosystems: conflicts, connectivity, and climate change
3. Ecological Society of America (2 posters); Society of Environmental Journalists (poster)
4. European Phenology Network meeting “Changing Time”, Wageningen; Ecological Society of America, invited speaker for proposed symposium (Importance of the abiotic environment for the ecology and evolution of flowers)

Ecological Society of America (3 presentations)

Rocky Mountain Biological Laboratory, symposium session chair and organizer (Integrating research across temporal scales)

Invited presentation at symposium: Diversity of Reproductive Systems in Plants: Ecology, Evolution and Conservation. Society for the Study of Species Biology, Sapporo, Japan.

1. Ecological Society of America (3 presentations); American Geophysical Union
2. Ecological Society of America; Open Science Conference on Global Change in Mountain Regions (Perth, Scotland)

Symposium speaker, Janet Meakin Poor Symposium, Chicago Botanic Garden

Symposium speaker, Bioscience Research & Technology Review Day, Univ. of Maryland

Energy Modeling Forum (Stanford University) Workshop on Climate Change Impacts and Integrated Assessment: Critical Issues in Climate Change. (Snowmass, Colorado)

1. Ecological Society of America; Mtn. Clim. 2006
2. Ecological Society of America; North American Pollinator Protection Campaign
3. National Tribal Environmental Council; Consortium for Integrated Climate Research in Western Mountains: MtnClim 2008. Silverton, CO; Ecological Society of America
4. Ecological Society of America
5. British Ecological Society; invited workshop presentation: "Ecosystem-level effects of climate change induced phenological shifts", Durham University, Durham, UK; Pollination biology proposal writing workshop, Nairobi, Kenya.
6. Ecological Society of America
7. American Geophysical Union; Botanical Society of America; Ecological Society of America; MtnClim 2012; North American Ornithological Congress; Phenology 2012

2013 Ecological Society of America; Annual meeting of the Ecological Society of Germany, Austria, and Switzerland (GfÖ)

2014 Ecological Society of America; MtnClim 2014; Plenary lecture at the International Symposium on Weather and Climate Extremes, Food Security and Biodiversity, sponsored by the WMO and FAO, at George Mason University; Joint 2014 Annual Meeting, British Ecological Society and Société Française d’Ecologie.

2015 Annual meeting of the Ecological Society of Mexico; Ecological Society of America; Third International Conference on Phenology (Turkey).

2016 Ecological Society of America; Colorado Native Plant Society; Guild of Rocky Mountain Ecologists and Evolutionary Biologists

2017 Ecological Society of America

2018 Ecological Society of America; MtClim

2019 Naturalist Night series, Aspen Center for Environmental Studies and Wilderness Workshop; https://www.youtube.com/watch?v=S-0l0M-pz-AEcological Society of America; Guild of Rocky Mountain Ecologists and Evolutionary Biologists; Australian Entomological Society

2020 Ecological Society of America; North American Congress for Conservation Biology

1. **Published abstracts**

Inouye, D. W. and O. R. Taylor. 1975. A mutualistic ant-plant relationship from a high altitude temperate region. American Zoologist 15:784.

Inouye, D. W. 1977. Resource partitioning in bumblebees. Journal of the New York Entomological Society 85:253-254.

Inouye, D. W. 1979. Patterns of corolla tube length of bumblebee flowers from two continents. Proc. 4th International Symposium on Pollination. Maryland Agricultural Experiment Station Special Miscellaneous Publications 1:461-463.

Inouye, D. W. and O. R. Taylor. 1979. The demography of *Frasera speciosa* (Gentianaceae). Botanical Society of America Miscellaneous Series Publication #157:27.

Inouye, D. W. and O. R. Taylor. 1979. Annual variation in flower production and predation on *Helianthella quinquenervis*, a temperate region ant-plant. Bulletin of the Ecological Society of America 60: 116-117.

Inouye, D. W. 1980. Mutualistic relationships between thistles and ants in Austria. Bulletin of the Ecological Society of America 61:112.

Inouye, D. W. 1981. The population biology of high elevation temperate region plants. Abstract from the XIII International Botanical Congress.

Inouye, D. W. 1981. Responses of honeybees to amino acid solutions mimicking nectars. Abstract from the XIII International Botanical Congress, p. 97.

Inouye, D. W. 1982. Flowering phenology of Rocky Mt. wildflowers: temporal and quantitative variation in flowering over a 10 year period. Botanical Society of America Miscellaneous Series Publication No. 162:37, and Bulletin of the Ecological Society of America 63(2):106.

Inouye, D. W. and Taylor, O. R. 1982. More puzzles in the story of *Frasera speciosa* (Gentianaceae), or, the more you study the less you know. Bulletin of the Ecological Society of America 63(2):184-185.

Inouye, D. W. 1984. Variation among sites and years in the population biology of *Ipomopsis aggregata*. Bulletin of the Ecological Society of America 65(2):145.

Inouye, D. W. 1987. The relative contributions of different components of flowering phenology to overall variation in flowering. American Journal of Botany 74(5):652.

Inouye, D. W. and S. A. Sommer. 1987. Flies as pollen eaters and pollinators of Rocky Mountain wildflowers. Bulletin of the Ecological Society of America 68(3):330.

Inouye, D. W. 1988. Variation among years in growth of *Erythronium grandiflorum* (Liliaceae) leaves. Bulletin of the Ecological Society of America 69:177.

Inouye, D. W. and L. Yang. 1988. Changes in spatial patterning of *Frasera speciosa* (Gentianaceae) during a 9-year study. American Journal of Botany 75 (supplement):75-76.

Inouye, D. W. 1989. Environmental control of variation in flowering by two *Delphinium* species in montane Colorado. American Journal of Botany 76 (supplement):108-109.

Inouye, D. W. 1989. Flight temperatures of blood- and nectar-feeding flies in montane Australia. Bulletin of the Ecological Society of America 70:151.

Inouye, D. W. and A. D. McGuire. 1990. Environmental control of the timing and abundance of flowering of *Delphinium nelsonii* (Ranunculaceae) in subalpine meadows of Colorado. Bulletin of the Ecological Society of America 71(2):197-198.

Inouye, D. W. 1991. Quantitative variation in flowering by *Delphinium barbeyi* (Ranunculaceae): environmental determinants and consequences for flower visitors. American Journal of Botany 78(6 supplement):57-58.

Inouye, D. W., and C. A. Kearns. 1993. Variation in dipteran pollinator populations: monitoring by malaise traps vs. direct observations. Pp. 264-265 in: G. K. Veeresh, R. U. Shaanker and K. N. Ganeshaiah, eds. Pollination in Tropics. Proceedings of the International Symposium on Pollination in Tropics. Bangalore, India.

Primack, R. B., and D. W. Inouye. 1993. Factors affecting pollinator visitation rates: a biogeographic comparison. P. 124 in: G. K. Veeresh, R. U. Shaanker and K. N. Ganeshaiah, eds. Pollination in Tropics. Proceedings of the International Symposium on Pollination in Tropics. Bangalore, India.

Inouye, D. W. 1994. Life history variation in *Frasera speciosa* (Gentianaceae): Is longer and bigger better? Supplement to Bulletin of the Ecological Society of America 75(2):103-104.

Inouye, David W., D. E. Gill, M. R. Dudash, and C. B. Fenster. 1994. A lexicon for pollination biology. American Journal of Botany 81(6 supplement):57.

Inouye, D. W. 1995. Long-term studies of flower abundance and floral diversity: How long is long enough? Supplement to Bulletin of the Ecological Society of America 76(2):128.

Lee, W. and D. W. Inouye. 1997. Temporal and quantitative variation in a long-term study of flowering by *Androsace septentrionalis* L. (Primulaceae). Supplement to Bulletin of the Ecological Society of America 78(4):129.

Inouye, D. W. 1997. The history of ecological software. Supplement to Bulletin of the Ecological Society of America 78(4):115.

Vail, S. G., and D. W. Inouye. 1998. The role of foliage growth in compensatory responses of *Ipomopsis aggregata* to simulated herbivory: models and experiments. Abstracts of the 83rd Annual Meeting, Ecological Society of America: 224.

Inouye, D. W., Indra Candanedo-Diaz, Trudi D’Ambrosio, Carrie Meek, Mariana Panuncio, and Wendy Walsh. 1999. Does the United States meet its CITES treat obligations in the trade of ginseng? Abstracts of the 13th Annual Meeting, Society for Conservation Biology.

Inouye, D. W. 1999. The effects of winter snowpack and frost on timing and abundance of flowering by *Erigeron speciosus*, a long-lived perennial from the Colorado Rocky Mountains. Abstracts of the 84th Annual Meeting, Ecological Society of America.

Inouye, D. W. 1999. El presente y futuro de la biología de la polinización, y el nuevo papel de la biología de la conservación en estudios de polinización. Proceedings of the First Colombian Congress of Botany - published on CD.

Inouye, D. W. 2000. The consequences of climate change for high-altitude hibernating and migratory species. Joint meeting of the British Ecological Society and the Ecological Society of America, Orlando, FL.

Inouye, D. W., and B. Barr. 2000. Implications of climate change for hibernators at high altitude and for altitudinal migrants. Abstracts of the 14th Annual Meeting of the Society for Conservation Biology.

Inouye, D. W. 2000. The effects of late spring frosts on the diversity and abundance of flowering in sub-alpine meadows. Abstracts of the 85th Annual Meeting, Ecological Society of America.

Boggs, C. L., and D. W. Inouye. 2000. Weather-driven resource availability controls butterfly population dynamics. Abstracts of the 85th Annual Meeting, Ecological Society of America.

Morales, M., and D. W. Inouye. 2000. The influence of snowpack on the timing and abundance of flowering in *Delphinium barbeyi*. Abstracts of the 85th Annual Meeting, Ecological Society of America.

Saavedra, F., and D. W. Inouye. 2000. Reproductive response of *Delphinium nelsonii* (Ranunculaceae) to a subalpine climate warming experiment. Abstracts of the 85th Annual Meeting, Ecological Society of America.

Armitage, K. B., and D. W. Inouye. 2000. Implications of changes in hibernation behavior by three high-altitude mammal species and correlations with climate change. Abstracts of the 85th Annual Meeting, Ecological Society of America.

Leigh, M. and D. W. Inouye. 2000. Highly skewed sex ratios of tephritid flies reared from two high-altitude *Erigeron* (Asteraceae) species: why do female flies predominate? Abstracts of the 85th Annual Meeting, Ecological Society of America.

Inouye, D. W. 2000. The growth and reproduction of ramets of *Veratrum californicum* (Liliaceae), a common long-lived clonal plant from the Colorado Rocky Mountains. Abstracts of Clone~2000. Current Progress & Developments in Clonal Plant Research. Held 20-25 August in Obergurgl, Austria.

Inouye, D. W. 2000. Loss of synchrony between high- and low-altitude flowering phenology due to climate change. **And**, The phenological consequences of climate change for high- altitude hibernating and migratory species. Presentation and poster at ”Progress in Phenology – Monitoring, Data Analysis, and Global Change Impacts”. Held 4-6 October in Freising, Germany (Technisches Universität München).

Inouye, D. W., and B. Barr. 2001. Climate change effects on phenology of Rocky Mountain plants and animals. (Invited symposium talk) Abstracts of the 8th Annual Conference, The Wildlife Society: 168.

Inouye, D. W., and G. Dodge. 2002. Spring snowpack depth and summer temperature affect flowering phenology and abundance in *Mertensia ciliata* (Boraginaceae)*.* Ecological Society of America.

Smith, B. R., M. A. Morales, M. C. Gardener and D. W. Inouye. 2002. Effects of top-down and bottom-up forces in an ant-plant mutualism. Ecological Society of America.

Inouye D. W. 2003. Abrupt climate change at high altitudes in the Colorado Rocky Mountains. **And**, Abrupt climate change affects flowering phenology and abundance of *Mertensia ciliata* (Boraginaceae) in the Colorado Rocky Mountains. Presentation and poster at “Changing Times – meeting of the European Phenology Network”. 31 March – 2 April in Wageningen, Holland.

Inouye, D. W. 2003. Modification of plant-pollinator interactions through consequences of global and regional climate changes. Ecological Society of America, annual meeting, Savannah, GA.

Dodge, G., D. Inouye and S. Louda. 2003. Non-target effects of biocontrol releases on native Colorado thistle species. Ecological Society of America, annual meeting, Savannah, GA.

Lambrecht, S., M. Loik, D. Inouye and J. Harte. 2003. How are the rates and resource costs of plant reproduction affected by global warming. Poster at the Ecological Society of America, annual meeting, Savannah, GA.

Inouye, D. 2004. Long-term variation and the role of abrupt climate change in the phenology and abundance of flowering by *Mertensia fusiformis* (bluebells; Polemoniaceae). Poster at the Ecological Society of America, annual meeting, Portland, OR.

Dodge, G., S. Louda and D. Inouye. 2004. Colonization and herbivory of native flora by introduced biocontrol agents. Ecological Society of America, annual meeting, Portland, OR.

Leigh, M., and D. Inouye. 2004. The ‘long arm’ of protective mutualism. Ecological Society of America, annual meeting, Portland, OR.

Inouye, D. W. 2005. Phenology and abundance of flowering in two early-season high-altitude Brassicaceae, *Thlaspi montanum* and *Draba aurea*, are influenced by environmental variables and climate change. Ecological Society of America, annual meeting, Montreal, Quebec.

Inouye, D. W. 2005. Consequences of abrupt climate change for hibernating animals and perennial wildflowers at high altitude. Open Science Conference on Global Change in Mountain Regions, Perth, Scotland.

Inouye, D. W. 2006. Ecological and evolutionary importance of plant reproductive responses to climate change. Ecological Society of America, annual meeting, Memphis, TN.

Inouye, D. W. 2006. Demographic consequences of climate change for a montane sunflower (*Helianthella quinquenervis*): Frost effects on population size and size structure. Consortium for Integrated Climate Research in Western Mountains. MtnClim 2006. Mount Hood, OR.

Wiley, Aleta, Mauricio Bedoya, Max Christian, Raquel Flores, David Inouye, Jean Jourdain, and Marco Rojas. 2007. Allocating carbon credits to increase development and to support renewable energy. Presentation at Annual Meeting of the United States Society for Ecological Economics, Pace University, New York, NY. 25 June 2007.

Inouye, D. W., and B.Barr. 2007. Changes in dates of emergence from hibernation by chipmunks, ground squirrels, and marmots at high altitude in the Colorado Rocky Mountains: An effect of climate change? Ecological Society of America, annual meeting, San Jose, CA.

Che-Castaldo, J.P. and D.W. Inouye. 2007. Role of local adaptation in the colonization of heavy-metal contaminated soils by *Thlaspi montanum montanum* (Brassicaceae). Ecological Society of America (ESA) Annual Meeting. San Jose, CA

Inouye, D. W. and B. Barr. 2008. Changes in dates of emergence from hibernation by chipmunks, ground squirrels, and marmots at high altitude in the Colorado Rocky Mountains: An effect of climate change? Consortium for Integrated Climate Research in Western Mountains. MtnClim 2008. Silverton, CO.

Miller-Rushing, A., D. W. Inouye, and R. B. Primack. 2008. How well do first flowering dates measure plant responses to climate change? Consortium for Integrated Climate Research in Western Mountains. MtnClim 2008. Silverton, CO.

Inouye, D. W. 2008. The consequences of phenology for demography, illustrated by long-term research in Colorado on *Helianthella quinquenervis* (aspen sunflower) at the Rocky Mountain Biological Laboratory. Ecological Society of America (ESA) Annual Meeting. Milwaukee, MN

Forrest, J., D. W. Inouye, and J. D. Thomson. 2008. Co-flowering patterns in subalpine meadows: Responses to interannual climate variation. Ecological Society of America (ESA) Annual Meeting.

Che-Castaldo, J.P. and D.W. Inouye. 2008. Demography of a metal-hyperaccumulating plant on contaminated and non-contaminated sites. Ecological Society of America (ESA) Annual Meeting.

Miller-Rushing, A. J., D. W. Inouye, and R. B. Primack. 2008. Community-level patterns of phenological change: Who is changing, who is not, why, and what it all means. Symposium presentation, Ecological Society of America (ESA) Annual Meeting.

Inouye, D. W. 2009. The effects of climate change on the phenological interactions of plants and pollinators. Ecological Society of America (ESA) Annual Meeting.

Wetherill, Karen R., D. W. Inouye, C. David Bertelsen, and Theresa M. Crimmins. 2009. Turnover and predictability of flower communities across two deserts and two mountains. Ecological Society of America (ESA) Annual Meeting.

Che-Castaldo, J. P., and D. W. Inouye. 2009. Demography of a long-lived monocarpic plant (*Frasera speciosa*): How dataset length affects the accuracy of demographic parameter estimates. Ecological Society of America (ESA) Annual Meeting.

### Che-Castaldo, J.P., and D.W. Inouye. 2009. Competition between *Thlaspi caerulescens* and *Thlaspi montanum*: can phytoremediation threaten native plant populations? Brownfields Conference. New Orleans, LA

### Che-Castaldo, J. P., and D. W. Inouye. 2010. Competition between a non-native metal-hyperaccumulating plant (*Thlaspi caerulescens*) and a native congener (*Thlaspi montanum*). Ecological Society of America (ESA) Annual Meeting.

Inouye, D. W., and B. Barr. 2010. Differing changes in hibernation phenology of three small mammal species in response to climate change. British Ecological Society meeting, Leeds, UK

Inouye, D. W. 2010. Changes in migration and hibernation phenology, and growing season length at high altitudes. The Wildlife Society annual meeting.

Inouye, D. W. 2011. ESA Annual Meeting: Summer precipitation synchronizes mast flowering with a four-year lag in a long-lived monocarpic gentian.

McKinney, A. and D. W. Inouye. 2011. ESA Annual Meeting: Flowering decisions in *Veratrum tenuipetalum* : A clonal mast-flowering herb with monocarpic ramets.

Sloat, L. L., C. A. Lamanna, G. Aldridge, B. J. Enquist, A. N. Henderson, D. W. Inouye, M. J. Stansberry, K. D. Whitney, and I. Billick. 2011. ESA Annual Meeting: A comprehensive functional trait database for the plants of the Rocky Mountain Biological Laboratory.

Inouye, D. W. and A. M. McKinney. 2012. Long-term shifts in species' flowering periods in a sub-alpine plant community. Botanical Society of America.

McKinney, A., P. Caradonna, D. Inouye, W. Barr, C. D. Bertelsen, and N. Waser. 2012. Asynchronous changes in phenology of migrating Broad-tailed Hummingbirds and their early-season nectar resources. Botanical Society of America.

Gezon, Z. J., D. W. Inouye, R. E. Irwin. 2012. ESA Annual Meeting: The effects of altered phenology on plant-pollinator interactions and plant reproduction.

Inouye, D.W., A. M. McKinney, A. J. Miller-Rushing, and L. A. Burkle. 2012. ESA Annual Meeting: Divergent phenological responses to climate cues in a 20-year record of syrphid flies and flowers.

Petry, W. K., A. M. McKinney, D. W. Inouye, K. A. Mooney, and J. D. Soule. 2012. ESA Annual Meeting: Warming up to changing trait frequencies: Rapid, climate change-induced shifts in population sex ratios along an elevation gradient.

McKinney, A. M., and D. W. Inouye. 2012. ESA Annual Meeting: Long-term shifts in species' flowering periods in a sub-alpine plant community.

Inouye, D. W., A. M. McKinney, P. CaraDonna, C. D. Bertelson, b. barr, and N. Waser. 2012. North American Ornithological Congress: Asynchronous changes in phenology of migrating Broad-tailed Hummingbirds and their early-season nectar resources

Inouye, D. W., and A. M. McKinney. Phenology 2012: Long-term flowering phenology shifts in a sub-alpine plant community.

McKinney, A. M. and D. W. Inouye. 2012. AGU Annual Meeting: Phenology of species interactions in response to climate change: long-term shifts in plants and their pollinators.

Inouye, D. W., and A. M. McKinney. 2012. AGU Annual Meeting: Phenological and ecological consequences of changes in winter snowpack. Invited paper in session “When Winter Changes”.

Inouye, D. W. 2013. ESA Annual Meeting. The importance of place in the development of ecological ideas (invited for an Organized Oral Session).

Weiss, J. S., and D. W. Inouye 2013. ESA Annual Meeting. The value of ECOLOG-L and how it has brought people from far and wide to one intellectual place (invited for an Organized Oral Session).

CaraDonna, P. J., A. M. Iler, and D. W. Inouye. 2013. ESA Annual Meeting. Species-specific shifts in flowering phenology influence community-level patterns: implications for plant-pollinator interactions.

Inouye, D. W., and A. M. Iler. 2013. Annual meeting of the Ecological Society of Germany, Austria, and Switzerland (GfÖ), Potsdam, 9-13 September. Phenological and ecological consequences of changes in winter snowpack.

Inouye, D. W., A. M. Iler, A. Miller-Rushing, L. A. Burkle, and E. B. Johnston. 2013. Annual meeting of the Ecological Society of Germany, Austria, and Switzerland (GfÖ), Potsdam, 9-13 September. Poster: Increasing temporal synchrony between syrphid flies and their floral resources despite differential phenological responses to climate change.

## Inouye, D. W. 2014. ESA Annual Meeting. Long-term data provide context for interpretation of ecological interactions.

## Gezon, Z. J., D. W. Inouye, and R. E. Irwin. 2014. ESA Annual Meeting. Phenological mismatch with bees and unfavorable abiotic conditions reduce Claytonia lanceolata reproduction in phenology field experiments.

Ortega, A. C., D. W. Inouye, and H. Steltzer. 2014. ESA Annual Meeting. Variations in soil moisture availability affect nectar production of three subalpine plant species in the family Ranunculaceae.

Campagnoni, A., A. J. Bibian, B. D Elderd, A. Iler, D. W. Inouye, H. Jacquemyn, B. Ochocki, H. S. Rogers, E. L. Schultz, M. E. Sneck, and T. E. X. Miller. 2014. ESA Annual Meeting. The effect of spatio-temporal heterogeneity on the dynamics of plant populations.

Pardee, G. L., D. W. Inouye, and R. Irwin. 2015. ESA Annual Meeting. Direct and indirect effects of frost events on plant growth and reproduction in montane regions of Colorado.

Iler, A., T. T. Høye, and D. W. Inouye. 2015. ESA Annual Meeting. Evidence of phenotypic plasticity and spurious relationships in long-term phenological responses to climate change.

Iler, A. M., T. E. X. Miller, J. L. Williams, and D. W. Inouye. 2015. British Ecological Society annual meeting. Population decline in response to climate change-induced earlier flowering phenology in a subalpine plant species.

Inouye, D. W. 2016. ESA Annual Meeting. The timing of things is changing because it’s getting hotter. In Up-Goer Five Challenge: Using Common Language to Communicate Your Science to the Public.

Ogilvie, J. E., S. R. Griffin, Z. J. Gezon, B. D. Inouye, N. Underwood, D. W. Inouye, and R. E. Irwin RE. 2016. Climate, flowering phenology, and bumble bee abundance. Scandanavian Association for Pollination Ecologists Annual Meeting, Abisko, Sweden.

Inouye, D. W. 2017. ESA Annual Meeting, The discovery of decadal cycles in Rocky Mountain flowering, facilitated by LTREB funding from NSF.

Vanderbilt, K. L., K. W. Wright, D. W. Inouye, C. D. Bertelsen, T. Crimmins, C. Gries, M. Servilla, M. C. O’Brien, D. Costa, R. Waide, P. C. Hanson, and C. A. Smith. 2017. Long-term phenology datasets and the Environmental Data Initiative (EDI): Facilitating future data syntheses. ESA Annual Meeting.

Ogilvie, J. E., S. R. Griffin, Z. J. Gezon, B. D. Inouye, N C. Underwood, D. W. Inouye, and R. E. Irwin. 2017. Bumble bee abundance is governed by climate-driven variation in floral phenology. ESA Annual Meeting.

Inouye, D. W., and b. barr. 2018. ESA Annual Meeting. How to hindcast phenology by combining contemporary observations with historical stream flow data.

Ogilvie, J. E., N. Underwood, B. D. Inouye, and D. W. Inouye. 2018. ESA Annual Meeting. Long-term floral resource responses to climate variation.

Inouye, D. W. 2019. ESA Annual Meeting. Open eyes and open mind: Can you teach the role of inquiry in ecology?

Breckheimer, I. K., Paul J. CaraDonna, Rebecca A. Durham, Amy M. Iler, Jane E. Ogilvie, Elli J. Theobald, and David W. Inouye. 2019. ESA Annual Meeting. Virtual transplant experiments reveal that climate filters mountain plant communities via interactions with phenological traits.

O’Leary, Donal S., D. W. Inouye, Ralph Dubayah, Chengquan Huang, and George C. Hurtt. 2020. ESA Annual Meeting. Quantifying ‘green wave’ velocity across North America using MODIS satellite imagery.

Inouye, Brian D., Rebecca M. Dalton, D. W. Inouye, and Nora Underwood. 2020. ESA Annual Meeting. Long-term declines in insect biomass and abundance at the Rocky Mountain Biological Laboratory, Colorado.

Inouye, D. W. 2020. ESA Annual Meeting. How to synchronize flowering four years in advance: Flowering by a long-lived monocarpic gentian.

Cobb, N., et al. 2020. Entomological Collection Network annual meeting (digital). iDigBees Network: Towards Complete Digitization of US Bee Collections to Promote Ecological-evolutionary Research in a Keystone Clade.

**g. Films, Tapes, Photographs, etc.**

Radio interviews about my research, WesTrends radio program, Boulder, CO, 7/89, 1/90; AAAS Science Update 4/90; Quirks and Qwarks (Canadian) 5/92; Nature Watch, 8/98; Nature Notes 7/99; VOA 2/00; Cultivated Gardener 2/00; Pulse of the Planet 5/01 (3 episodes); EarthWatch 5/00; Nature Notes (KBUT, Crested Butte, CO) 7/00, 7/01, 7/02, 7/03, 8/03, 7/05, 7/06, 7/07, 7/08, 6/09, 7/11; 7/12; Living on Earth 10/10/08, 6/8/12; Hill & Dale talk radio, 9/11; Aspen public radio 7/12; Colorado Public Radio show “Colorado Matters” 12/16; Think Radio 3/19.

KVNF radio show “As the Worm Turns”, April and May 2017 – called in comments about pollinators.

Television news stories about Mountain Research Station climate program, 3/90

Television story on wildflowers at RMBL, Denver TV station, 7/92; AP News, 7/06; Sean Hannity show 3/10

Web stories about research on enn.com, ens.com and cnn.com 2/00; on academicpress.com and sciencemag.org 8/00, livescience.com 2/07; Earth Policy Institute blog 3/25/10; AP news 6/18

Public lectures about research, in Gunnison, CO 1982; Mt. Crested Butte, CO 1983, 1984; Wilmington DE 1984; Baltimore MD 1985; Keystone Science Center and Vail, CO, 1990; National Capital Area Federation of Garden Clubs, 1997; Green Spring Gardens (Alexandria, VA), 2007, 2010; Presentation to the Potowmack Chapter of the Virginia Native Plant Society 2012; Audubon Society chapters 2017, 2018.

Television interview about Galapagos Islands oil spill (Reuters Television), 1/01

Commentator for newspaper article on mute swans, Rockville (MD) Gazette, 2/7/01

Photographs published in:

Crested Butte Chronicle, Crested Butte News, Gunnison Country Times (multiple pictures)

1996: Global Biodiversity/La biodiversité mondiale 6(3): 3 photographs of nectar-robbing bumblebees

Withgott, J. 2000. Botanical nursing. BioScience 50(6):479-484

Jensen, M. 2004. Climate warming shakes up species. BioScience 54(8):722-729

Two articles in Natural History magazine, 1984, 1993

Chronicle of Higher Education, 2002

National Wildlife, April/May 2005: 21

Pollinators and Pollination: A resource book for policy and practice. Eardley et al. 2006

2006 calendar of the College of Chemical and Life Sciences, Univ. of Maryland

Land & People (Trust for Public Lands) 18(1), 2006

Crested Butte Land Trust advertising brochure and 2007 calendar

Wild About Wildflowers (Katherine Darrow, 2006)

River and Desert Plants of the Grand Canyon (2006, Mountain Press Publishing Co.)

Blackwell Science 2007 Plant Science calendar

Grand Canyon River Guide (2007, Westwater Press)

Status of Pollinators in North America (2007, National Academies Press)

<http://audubonmagazine.org/audubonliving/audubonliving0705-webexclusives.html>

Washington Post article June 2007: <http://www.washingtonpost.com/wp-dyn/content/article/2007/06/20/AR2007062000548.html>; August 2008: <http://www.washingtonpost.com/wp-dyn/content/article/2008/08/06/AR2008080600958.html>;

The Wildlife Professional Fall 2008

January 2009: <http://www.washingtonpost.com/wp-dyn/content/article/2009/01/28/AR2009012801045.html>

Crested Butte Magazine, Winter 2007/08, Summer 2008, Summer 2011

**Attracting Native Pollinators: Protecting North America’s Bees and Butterflies, 2011**

**Science News Prime cover 28 May 2012; Ecology cover September 2012.**

**Highly Commended** image in *BMC Ecology* Image Competition, 2013

<http://www.nature.com/naturejobs/science/articles/10.1038/nj7475-301a>

Bumble Bees of North America. Williams et al. 2014

COSEWIC Assessment and Status Report on the Western Bumble Bee Bombus occidentalis in Canada - 2014

Cover photograph, *Oikos* January 2015

Canadian Wildlife Service. 2021. Field guide, *Bombus occidentalis* image

Research described in a major article about climate change, Rocky Mountain News, 12/14/05, and two articles in the Aspen Daily News, 2007; also an article in Rocky Mountain Chronicle, 2/14/08: www.rmchronicle.com/index.php?option=com\_content&task=view&id=1962.

Established and maintain the Pollination Biology Database, with >10,900 references, now hosted on Mendeley.

Citizen Science Monitoring Guide, Pacific Northwest; Xerces Society, 2014.

Citizen Scientist Pollinator Monitoring Guide, California Pollinator Project, Xerces Society 2010.

<https://science360.gov/obj/video/bfd18162-c3b8-42e8-a7b3-64ab7b898818/science-now-54>

<https://apnews.com/c895b9ac7e4a4370953e51862285c2ce/Looking-for-signs-of-global-warming?-They%27re-all-around-you&utm_source=EHN&utm_campaign=efac197811-Science_saturday&utm_medium=email&utm_term=0_8573f35474-efac197811-99048829>

**h. Contracts and Grants**

##### From federal funding sources

NSF grant for improving doctoral dissertation research in the field sciences. "Resource partitioning, niche breadth and niche overlap of bumblebees in two high altitude sites in Colorado." 1974-76, $2,900.

NSF grant, Co-P.I. with O. R. Taylor. "Interactions in a plant, formicids, predator system." 1976-78, $24,400. DEB 75-15422.

NSF grant, Co-P.I. with O. R. Taylor. "The role of pollinator effectiveness in plant population dynamics." 1978-1981, $83,740. DEB 78-07784.

U.S. Dept. of Energy grant written on behalf of the Rocky Mtn. Biological Laboratory. "A small hydroelectric power plant demonstration project." 1979-1980, $12,720.

U.S. A.I.D. grant from a University of Maryland Title XII Strengthening Grant. "The impact of Africanized honeybees on native plant-pollinator communities in Panama." 1979, $1,705.

Per diem grant for a field study of native bees and flowers in Panama, from Smithsonian Institution grant to Dr. David Roubik, for 2 trips, December 1979 and March 1980, $595.

NSF Doctoral Dissertation Award on behalf of R. Fritz. "Interactions of parasites on their host plant: mutualisms and plant defense." 1980-82, $4,094.

Per diem grant for a field study of native bees and flowers in Panama, from Smithsonian Institution grant to Dr. David Roubik. 1981, $1,050.

NSF grant, "Plant population dynamics: A comparative study of interactions among pollination, seed predation and life histories." Co-P.I. O. R. Taylor. 1981-1984, $125,000. BSR 81-08387.

NSF grant, "A comparison of pollination ecology in high elevation habitats in Colorado and Australia." 1983-1984, $10,000.

NSF grant, Co-P.I. with S. Allen and N. Waser. "Construction of multi-user research laboratory at Rocky Mountain Biological Laboratory", $110,000, 1988-1990.

NSF Proposal, "An experimental study of the phenology of Rocky Mountain wildflowers." $187,336. (Recommended for funding by Population Biology panel in 1988, but not funded).

NSF grant, "Construction of an alpine tundra laboratory." 1989-90, $120,000. (For the Mountain Research Station, University of Colorado). DBI-8912249

NSF grant, Co-Principal Investigator with D. Johns and A. Beattie. "Renovation and improvement of research facilities at the Rocky Mtn. Biological Laboratory." 1986-1987, $80,750.

NSF grant, Co-P.I. with S. Allen. "Modems for the Rocky Mountain Biological Laboratory"; 1992, $2,000.

NSF grant, "Workshop in Plant Reproductive Biology." Co-PIs Kearns, Thomson, Waser. 1994-1996, $83,449. DUE-9354008.

NSF grant, "Long-Term Research in Environmental Biology: Rocky Mountain Wildflowers." 1994-1996, $40,000. DEB 94-08382.

NSF REU Supplement, "Long-Term Research in Environmental Biology: Rocky Mountain Wildflowers." 1996, $5,000. DEB.

NSF grant, "Workshop in Plant Reproductive Biology." Co-PIs Kearns, Thomson, Waser. 1996-1998, $50,000. DUE 95-54745.

Grant from NASA/NSF/DOE/USDA/NOAA Joint program on terrestrial ecology and global change, "Population and community-level consequences of early-summer frosts, a phenomenon that may decrease as the global climate changes" 1998-2002, $240,000. IBN-98-14509.

NSF grant, “Enhancing data management at the Rocky Mountain Biological Laboratory”. 1998-2000, $30,000; co-PI with Taber Allison, Paul Rich. DBI-9812388.

Grant from USGS Patuxent Wildlife Research Center on behalf of Linda Weir (CONS student). “Development and evaluation of a national monitoring program for amphibians”. 1999-2001. $54,099 for two years.

Grant from the National Park Service. “Protection of tributaries on CIA property in George Washington Memorial Parkway”. Co-PI with J. M. Dietz. $1,500 for 2001.

Grant from NSF, March 2001. ROA (RUI) supplement to my NSF grant IBN-98-14509 on behalf of Dr. Manuel Morales (Williams College). $14,905.

Grant from NSF, Co-PI with I. Billick and R. Irwin. Researcher and student housing at the Rocky Mountain Biological Laboratory. 9/1/02-8/31/05 $180,000.

Pre-proposal submitted to NSF, June 2001, Co-PI with R. Costanza (PI), H. Daly, and 3 others. Ecological Economics: Understanding and managing the dynamic, adaptive, co-evolving interactions between human systems and the rest of nature. 5 years, $2,699,909. Recommended for submission of full proposal by panel, 11/01.

Grant from NSF, Co-PI Billy Barr. LTREB: Abrupt climate change at high altitudes and its ecological consequences. 1/15/2003-2008, $300,000. DEB-0238331. Supplements for Research Experience for Teachers in 2004, 2006, $10,000 each).

Grant from NSF, Co-PIs Billick, Harte, Irwin, Peckarsky: Acquisition of GIS and GPS equipment by the Rocky Mountain Biological Lab to enable spatially explicit research and training. 11/01/04 – 11/01/07, $429,695, Award 0420910.

Grant from National Park Service: Threat Assessment for Rare Endemic Plant (*Cirsium ownbeyi*). On behalf of graduate student Gary Dodge. $4,500. 09/01/04 – 08/31/06.

Grant from USDA – Natural Resources Conservation Service: Pollination ecological information for land conservation. $15,000. 09/01/04-09/30/05.

Grant from National Park Service: Parks, pollinators, and habitats workshop. Co-PI Stylinski (University of Maryland Center for Environmental Science, Appalachian Laboratory). $29,482. 2004-05.

Grant from USDA – Natural Resources Conservation Service: Pollination ecological information for land conservation $10,000. 2005-2006. $5,000 supplement 2005.

Grant from NSF: Research Coordination Network – USA National Phenology Network. PI’s Mark Schwartz and Susan Mazer, Non co-PI senior personnel: Stephen Baenziger, Julio Betancourt, Carol Brewer, Mike Dettinger, David Inouye, Bev Law, Eric Post, Brad Reed, Robert Waide. $499,999, 2007-2012. IOB-0639794.

Grant from NSF: REU supplement, summer 2007. $6,500 to support a student at RMBL for work on altitudinal distribution of bumble bees and how distributions have changed in 30 years.

Listed as Senior Personnel on an NSF instrumentation grant for RMBL $473,800 over three years.

Grant from NSF: RET supplement, summer 2008. $8,700 to support a teacher at RMBL.

Grant from NSF: DDIG: Ecology and the Use of a Metal-Hyperaccumulating Plant in Phytoremediation. Judy Che-Castaldo, graduate student. $13,290. DEB 0909909.

Grant from NSF. LTREB: Drivers and consequences of phenological change at high altitudes. Co-PIs b. barr, R. E. Irwin, A. J. Miller-Rushing. 7/15/09 – 7/15/14. $448,995. DEB 0922080.

Grant from NSF. LTREB: Drivers and consequences of phenological change at high altitudes. Co-PIs b. barr, R. E. Irwin, N. Underwood, and B. D. Inouye. 7/15/14 – 6/30/19. $450,000. DEB-1354104.

Grant from NSF: LTREB: Phenological responsiveness of plants and bees: consequences for species, interactions, community composition and productivity. Co-PIs A. Classen, B. D. Inouye, R. E. Irwin, N. E. Underwood. 7/15/19 – 6/30/20. $171,416. DEB-1912006.

Grant from USDA, National Institute of Food and Agriculture, Agriculture and Food Research Initiative: National Native Bee Monitoring Plan for the U.S. P.D. Sarah Woodard; D.W.I. is one of Co-PDs 2/1/20 – 1/31/23. $389,000.

Grant from NSF. LTREB: Phenological responsiveness of plants and bees: consequences for species, interactions, community composition and productivity. PI N. E. Underwood, co-PIs A. Classen, B. D. Inouye, R. E. Irwin. 12/1/20 – 11/30/25. $741,146. DEB-2016749.

Grant from USDA NIFA: National Bee Monitoring Program for the U.S. P.D. S. H. Woodard, Co-P.D. D. W. Inouye and 10 others. 4/20 – 3/25.

Collaborator on grant from NSF: PIs M. C. Stoddard and N. Whiteman. Mechanisms of color perception in a population of hummingbirds. IOS Collaborative Grant 2029538, $1,043,940, 2020-2024.

##### From non-federal funding sources

Grant-in-Aid of Research from Sigma Xi. "Determination of the variation in sugar and amino acid composition of extra-floral nectar from *Helianthella quinquenervis* populations over an altitudinal range in the Colorado Rockies. 1975 ($300).

Dissertation Research Grant, from the Smith Fund, Administrative Board of the Graduate School, University of North Carolina. 1975.

University of Maryland General Research Board Faculty Research Grant for spring semester 1981 ($10,218).

Grant from Earthwatch, Co-P.I. with N. M. Waser. "Ecology of plants and pollinators in the Colorado Rocky Mountains." Summer 1982 ($7,122 and the services of 18 volunteers for 2 weeks each).

Grant from Earthwatch, Co-P.I. with N. M. Waser. "Ecology of plants and pollinators in the Colorado Rocky Mountains." Summer 1983 ($10,575 and the services of 23 volunteers for 2 weeks each).

Grant from Earthwatch. "Rocky Mountain wildflowers." Summer 1984 ($7,650 and the services of 17 volunteers for 2 weeks each).

Grant from Earthwatch. "Rocky Mountain plants and pollinators"; Summer 1985 ($7,500 and the services of 15 volunteers for 2 weeks each).

Grant from Earthwatch. "Rocky Mountain plants and pollinators"; Summer 1986 ($10,000 and the services of 20 volunteers for 2 weeks each).

Grant from Earthwatch. "Rocky Mountain plants and pollinators"; Summer 1987 ($9,600 and the services of 16 volunteers for 2 weeks each).

Grant from Earthwatch. "Rocky Mountain plants and pollinators"; Summer 1988 ($9,000 and the services of 15 volunteers for 2 weeks each).

Grant from Pew Charitable Trust. "Integrated Approaches for Training in Conservation and Sustainable Development." Co-P.I. with J. D. Allan. 1988-89 ($30,000, matched with $30,000 by University of MD).

Grant from Earthwatch. "Rocky Mountain plants and pollinators"; Summer 1989 ($9,000 and the services of 18 volunteers for 2 weeks each).

Grant from Earthwatch. "Rocky Mountain plants and pollinators"; Summer 1990 ($6,160 and the services of 11 volunteers for 2 weeks each).

Grant from Earthwatch. "The pollination biology of Rocky Mountain wildflowers"; Co-P.I. with C. A. Kearns. Summer 1990 ($10,501 and the services of 14 volunteers for 2 weeks each).

Grant from Earthwatch. "Rocky Mountain plants and pollinators"; Summer 1991 ($11,500 and the services of 20 volunteers for 2 weeks each).

Grant from Earthwatch. "The pollination biology of Rocky Mountain wildflowers"; Summer 1991 ($4,780 and the services of 7 volunteers for 2 weeks).

Grant from Partners of the Americas Development Education Program (Co-PI with T. Shehata); 1991-92 ($4,000).

Grant from Earthwatch. "Rocky Mountain plants and pollinators"; Summer 1992 ($11,700 and the services of 16 volunteers for 2 weeks each).

Grant from Earthwatch. "The pollination biology of Rocky Mountain wildflowers"; Summer 1992 ($5,960 and the services of 8 volunteers for 2 weeks).

Grant from Earthwatch. "Research at the Rocky Mtn. Biological Laboratory: Alpine flora and fauna"; co-P.I. with S. Lohr, summer 1993 ($20,000 and the services of 26 volunteers for 2 weeks each).

Grant from Earthwatch. "Rocky Mountain Wildflowers"; summer 1994 ($18,000 and the services of 17 volunteers for 2 weeks each).

Grant from Earthwatch. "Rocky Mountain Wildflowers"; summer 1995 ($18,000 and the services of 17 volunteers for 2 weeks each).

Grant from Earthwatch. "Rocky Mountain Wildflowers"; summer 1996 ($11,250 and the services of 15 volunteers for 2 weeks each).

Grant from Earthwatch. "Rocky Mountain Wildflowers"; summer 1997 ($13,500 and the services of 18 volunteers for 2 weeks each).

Inter-American Foundation. IAF Fellowship on behalf of Mariana Panuncio ($2,800 for work in Peru, 9/97 - 10/99).

Grant from Earthwatch. "Rocky Mountain Wildflowers"; summer 1998 ($12,260 and the services of 17 volunteers for 2 weeks each).

Grant from Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora. “A proposal to review the taxonomy and distribution of the genus *Guaiacum* in Mexico”; 2001 ($10,000). On behalf of two graduate students in the CONS graduate program.

Grant from Western Hummingbird Partnership, summer 2014, for purchase of radio transmitters to put on hummingbirds, and a receiver for tracking them. $1,600.

**i. Fellowships, Prizes, and Awards**

1971 Awarded National Defense Education Act Fellowship, 1971-74

1976 Awarded NATO Postdoctoral Fellowship in Science

1980 Elected to Society of American Naturalists

1981 Awarded University of Maryland General Research Board Faculty Research Grant

1982 Golden Clothespin Award, Rocky Mtn. Biological Laboratory

1983 Golden Clothespin Award, Rocky Mtn. Biological Laboratory

1987 Awarded University of Maryland Graduate Research Board Summer Research Award

1989 Appointed Honor Lecturer for The Association of Big 8 Universities (CU representative)

Represented University of Colorado on joint CU - CSU environmental mission to USSR

1992 Elected to Elective Member status, American Ornithologists' Union

1993 Elected Fellow, American Association for the Advancement of Science

1994 Outstanding teacher award, Celebrating Teachers program, University of MD

1995 Volunteer of the Year Award, Rocky Mtn. Biological Laboratory

2001 University of Maryland General Research Board Semester Research Award

2004 Selected for "Profiles of Ecologists" poster, annual meeting of the Ecological Society

2005 Distinguished International Service Award, University of Maryland

2005 Ethnic Minority Achievement Award for instructional units, for CONS program, University of Maryland

2007 University System of Maryland Board of Regents’ Faculty Award for Mentoring

2013 Honoree, 6th Annual University-Wide Celebration of Scholarship and Research, U MD

Invited speaker, Inauguration of the National Institute of Ecology, Seocheon, S. Korea

1. Special Guest, Ecological Society of Japan, annual meeting, Hiroshima

2015 Elected Fellow of the Ecological Society of America

1. **Editorships, Editorial Boards, and Reviewing Activities for Journals and Other Learned Publications**

Board of Editors, Ecological Society of America: 1980-82

Editor, Technological Tools column, Bulletin of the Ecological Society of America, 1985 – 2010

Editorial Board, Plant Species Biology: 1985 – present

Editorial Board, Ecological Research, 2007 – present

Editorial Board, Climate Change Responses, 2013 – 2018

Editorial Board, International Journal of Biometeorology, 2014 – present

Specialty Chief Editor for Plant Conservation, Frontiers in Conservation Science, 2020 –

Acting associate editor for pollination biology, Frontiers in Ecology and Evolution, 2020 -

1980 Reviewer for: NSF; National Geographic Society; Smithsonian Institution; Xerces Society; American Naturalist; Ecology; Madroño, Science, Charles E. Merrill Publishing Co.

1981 Reviewer for: Chapman and Hall, Ltd.; Ecology; Quarterly Review of Biology; Condor; American Naturalist; NSF.

Federation of American Scientists' Correspondent for University of Maryland

1982 Reviewer for: Ecology; Oikos; Science; Xerces Society; Charles E. Merrill Publishing Co.; NSF

1983 Reviewer for: Earthwatch, Ecology, NSF, Oecologia, Oikos

1984 Reviewer for: American Midland Naturalist, American Naturalist, Ecology, J. Apicultural Research, NSF, Oikos

1985 Reviewer for: American Midland Naturalist, American Naturalist, Armed Forces and Society, Center for Field Research, Entomological Society of America, Journal of Apicultural Research, Kansas Entomological Society of America

1986 Reviewer for: American Naturalist, Ecology, NSF, Research Corporation

1987 Reviewer for: Biotropica, Canadian Journal of Zoology, Conservation Biology, Earthwatch,

Ecological Entomology, Evolution, NSF

1988 Reviewer for: American Midland Naturalist, American Naturalist, NSF, Oikos

1989 Reviewer for: American Midland Naturalist; American Naturalist; Ecological Entomology;

Ecology; Israel Journal of Botany; NSF

1990 Reviewer for: American Naturalist; Condor; Center for Field Research; Ecological Entomology; Holarctic Ecology; NSF

1991 Reviewer for Earthwatch; Ecology; Journal of Ecology; NSF

1992 Reviewer for American Midland Naturalist; Biotropica; Condor; Ecology; Natural History; NSF

Reviewer for 1992 EDUCOM Higher Education Software Awards Program

1993 Reviewer for: American Journal of Botany; Arctic and Alpine Research; Biotropica; Condor; Ecology; Journal of Ecology; National Geographic Society; NSF

Reviewer for: 1993 EDUCOM Higher Education Software Awards Program

1994 Reviewer for: American Journal of Botany; Biological Conservation; Condor; Ecology; National Geographic; NSF; Oecologica; Oikos; OTS; Proceedings of the National Academy of Sciences

1995 Reviewer for: American Midland Naturalist; American Journal of Botany; Bulletin of the Torrey Botanical Club, Ecology; Journal of Applied Ecology; National Geographic Society

1996 Reviewer for: Acta Oecologica; American Journal of Botany; American Naturalist; Biotropica; Condor; Global Change Biology; Journal of the Kansas Entomological Society; Journal of Wildlife Management

1997 Reviewer for: Acta Oecologica; American Journal of Botany; American Naturalist; Auk; Ecology; Journal of Economic Entomology; Plant Ecology; Oikos

1998 Reviewer for: American Journal of Botany; American Midland Naturalist; Annals of Botany; Biotropica; Ecology; Evolution; Journal of Plant Research; NSF; Oikos; Southwestern Naturalist; Wilson Bulletin

1999 Reviewer for: American Journal of Botany; Annals of Botany; Canadian Journal of Botany; Ecology; National Environment Research Council (UK); Oikos; Plant Species Biology; Wetlands; Wilson Bulletin; World Resources Institute

2000 Reviewer for: American Journal of Botany; Annals of the Missouri Botanical Garden; Biotropica; Conservation Biology; Earthwatch; Ecology; Ecoscience; National Academy of Sciences (USAID – Entomology panel); National Geographic; NSF; Oecologia; Oikos; Southwestern Naturalist

2001 Reviewer for: Arctic, Antarctic, and Alpine Research; Biological Invasions; Conservation Biology; Ecology; Ecosystems; Journal of Applied Ecology; Journal of the Torrey Botanical Society; National Fisdh and Wildlife Association; Natural Environment Research Council (UK); New Phytologist; NSERC (Canada); Oikos; Plant Species Biology; PNAS; TREE; University of Arizona Press; Western North American Naturalist.

2002 International Review Board, Annals of Botany.

Reviewer for: American Journal of Botany; American Naturalist; Arctic, Antarctic and Alpine Research; Canadian Journal of Botany; Earthwatch; Ecology; Evolution; International Journal of Biometeorology; Global Change Biology; National Geographic Society; NSF-EPSCoR MONTS; Secretariat for the Vancouver Island Marmot Recovery Programme; Southeastern Naturalist; Southwestern Naturalist; Wilson Bulletin

2003 Reviewer for: Biometeorology; Botanical Journal of the Linnean Society; Conservation Biology; Global Ecology and Biogeography; Ecology; The National Fish and Wildlife Foundation; Naturwissenschaften; NSF; Oecologia; Oikos; South African National Research Foundation; Western North American Naturalist

2004 Reviewer for: American Journal of Botany; American Midland Naturalist; American Naturalist; Auk; Biological Conservation; Canadian Journal of Zoology; Conservation Biology; Ecology Letters; International Journal of Plant Sciences; Journal of Applied Ecology; Journal of Ecology; Journal of Tropical Ecology; Oecologia; Science; Wilson Bulletin

2005 Reviewer for: Annals of Botany; Annales Botannici Fennici; Biological Conservation; Biotechnology and Biological Sciences Research council (UK); Ecological Applications; Ecological Entomology; Global Ecology and Biogeography; International Journal of Plant Sciences; Journal of Field Ornithology; National Fish and Wildlife Foundation; NSF; Oecologia; Plant Species Biology; TREE; Wilson Bulletin

2006 Reviewer for: Auk; Behavioral Ecology; Canadian Entomologist; Canadian Journal of Botany; Ecological Monographs; International Journal of Biometeorology; International Journal of Plant Science; NSF; New Phytologist; PLoS Biology; PNAS; Biotechnology and Biological Sciences Research Council, UK; MacArthur Fellows program

2007 Reviewer for: American Naturalist; Annals of Botany; Auk; Basic and Applied Ecology; Biological Journal of the Linnean Society; Biology Letters; Biotechnology and Biological Sciences Research Council (UK); Canadian Journal of Botany; Ecology Letters; The Environmentalist; FAO (Rapid Assessment of Pollinators' Status); Journal of Geophysical Research; Naturwissenschaften; NSF

2008 Reviewer for: Annals of Botany (4); Apidologie; Arctic, Antarctic, and Alpine Research; Australian Journal of Botany; Biological Reviews; Climatic Change; Ecological Applications; Ecology Letters (2); Ecoscience; Frontiers in Ecology and the Environment; Global Change Biology; Journal of Tropical Ecology; Naturwissenschaften; NSF; Oikos

2009 Reviewer for: American Journal of Botany; Annals of Botany (2); Arctic, Antarctic, and Alpine Research; Biological Invasions; Biotechnology and Biological Sciences Research Council (UK); British Council, Israel - Britain-Israel Research and Academic Partnership; Climate Research (2); Conservation Biology; Ecological Monographs; Ecological Research; Ecology; Ecoscience; European Research Council; Functional Ecology; Global Change Biology; Global Ecology and Biogeography (2); Journal of Ecology (3); Journal of Tropical Ecology; Global Change Biology; Natural Environment Research Council of the UK ; NSF (2); Oikos; PNAS (2); The Professional Geographer; Philosophical Transactions of the Royal Society B

2010 Reviewer for: American Journal of Botany (2); American Philosophical Society (Lewis and Clark Fund for Exploration and Field Research (7)); Annals of Botany; BioScience; Biotechnology and Biological Sciences Research Council (UK); Climatic Change; Diversity and Distributions; Ecology Letters (2); Ecosphere; Frontiers in Ecology and the Environment; Global Change Biology; International Journal of Biometeorology (2); Journal of Ecology; Journal of Pollination Ecology; NSF (21); Oecologia; PNAS (3); PLoS ONE (2); Population Ecology (2); Wilson Journal of Ornithology

2011 Annals of Botany (2); Arctic, Antarctic, and Alpine Research (3); Austral Ecology; Biodiversity and Conservation; Botany (2); Diversity and Distributions; Ecology; Ecology Letters; Evolutionary Ecology; Global Change Biology (2); Insect Conservation and Diversity (2); International Journal of Biometeorology (2); International Journal of Climatology; Journal of Applied Ecology; Journal of Ecology (2); Journal of Insect Science; Journal of Pollination Ecology; National Geographic Society (2); New Phytologist (2); Oikos; Proceedings of the Royal Society B

### 2012 Arctic, Antarctic, and Alpine Research (2); [Biotechnology and Biological Sciences Research Council](http://www.bbsrc.ac.uk/) (UK); Biotropica; Botany (2); Ecology; Ecological Applications; Ecology Letters; Environment, Systems and Decisions; Global Change Biology (4); International Journal of Biometeorology (4); Journal of Ecology (2); Journal of Economic Entomology; Mountain Research and Development; National Geographic Society; Natural Areas Journal; New Phytologist (3); PLoS ONE; NSF; Philosophical Transactions of the Royal Society; PNAS; Proceedings of the Royal Society B; Science

2013 African Journal of Ecology; American Journal of Botany (2); Basic and Applied Ecology; BioScience; Earthwatch; Ecological Entomology; Ecology; Global Change Biology (2); International Journal of Biometeorology (2); Journal of Animal Ecology; Journal of Biogeography; Journal of Ecology (2); Journal of the Kansas Entomological Society; National Geographic Society; Nature; New Phytologist (3); NSF; Plant Biology (2); PLOS ONE; PNAS; Proceedings of the Royal Society B

2014 American Journal of Botany (4); Animal Diversity and Conservation; Annals of Botany (2); Basic and Applied Ecology; Axios; Biodiversity and Conservation; BioScience; Climate Research; Ecology (2); Conservation Letters; Functional Ecology; International Journal of Biometeorology (2); Journal of Animal Ecology (3); Journal of Ecology; Journal of Pollination Ecology; Meteorology and Atmospheric Physics; National Geographic Society; Nature; NSF; Oecologia (2); Plant Biology (2); PNAS; Progress in Physical Geography

2015 American Journal of Botany (2); Annals of Botany; Behavioral Ecology and Sociobiology (2); Current Biology; Ecology; Freiburg Institute for Advanced Studies; Functional Ecology; Global Change Biology; Graduate Women in Science, fellowship program; International Journal of Biometeorology; Journal of Ecology; Journal of Hymenoptera Research; National Geographic Society (2); NSF (Graduate Research Fellowships, CBET – Environmental Stability); Nature; Northwest Science; Oecologia; Oikos (2); PeerJ; PNAS (2); PLOS ONE (2); Proceedings of the Royal Society B; Progress in Physical Geography; Science (2)

2016 Annals of Botany; Basic and Applied Ecology; Biology Letters; Ecology Letters (2); Environmental Entomology; Global Change Biology (3); International Journal of Biometeorology (3); Israel Science Foundation; Journal of Ecology (2); Journal of Pollination Ecology (3); Journal of Tropical Ecology; Oikos; PLOS ONE; PNAS; Princeton University Press; Royal Society Open Science; Science

2017 Guest Associate Editor, Frontiers in Ecology & the Environment; American Naturalist; Annals of Botany (2); Apidologie (2); Biology Letters (2); Botany; Comparative Biochemistry and Physiology; Ecology (2); Ecology and Evolution (2); Ecology Letters (4); Frontiers in Plant Science; Global Change Biology (2); Journal of Animal Ecology; Nature; Nature Climate Change (3); NSF; New Phytologist; Oecologia (3); Plant Biology (2); Plant Ecology; PLOS ONE (3); PNAS (5); The Science of Nature (Naturwissenschaften)

2018 Guest Associate Editor, Frontiers in Ecology & the Environment; American Journal of Botany; Annals of Botany; Annales Botanici Fennici; Applications in Plant Sciences; Biological Conservation (2); BMC Ecology (2); Ecological Entomology (2); Ecological Monographs; Ecology and Evolution; Ecology Letters; Environmental Pollution (3); Global Change Biology (2); Journal of Plant Research; Journal of Tropical Ecology; Methods in Ecology & Evolution; Nature (2); NSF; Oikos; PLOS ONE; PNAS; Rhodora; Science of the Total Environment; Tropical Conservation Science (2)

2019 Acta Oecologica; Agricultural and Environmental Letters; American Journal of Botany; Applications in Plant Sciences; Australian Journal of Botany; Biology Letters (2); BMC Ecology; Earthwatch; Ecography (2); Ecological Monographs; Ecological Research; Ecology; Global Change Biology (2); Global Ecology & Biogeography; Journal of Asia-Pacific Entomology; Journal of Ornithology; Journal of Pollination Ecology (3); Plant Biology; Plant Ecology and Diversity; PLOS ONE (3); PNAS (2); Science; Tropical Conservation Science

2020 Acta Oecologica; Agricultural and Forest Meteorology; Animal Behaviour; Annals of Botany; Biotropica; Ecography; Ecological Applications; Ecological Entomology (2); Ecology; Ecology Letters (2); Environmental Entomology (3); Environmental Pollution; Frontiers in Ecology and the Environment; Insects (3); Journal of Ecology; Journal of the Torrey Botanical Society; Nature (2); New Phytologist (3); NSF; Oecologia; Oikos; One Earth; PLOS ONE (4); PNAS; Proceedings of the Royal Society (B) (2); Psyche; Science of the Total Environment; Scientific Reports; Sustainability; Urban Ecosystems; Western North American Naturalist

2021 Botany (2); Current Opinion in Insect Science (2); Global Change Biology; Hortscience; Insects (2); Journal of Ecology; Journal of Natural History; Plant Ecology

1. **Membership in professional organizations**

American Association for the Advancement for Science

American Association of University Professors

American Institute of Biological Sciences

American Ornithologists' Union

Botanical Society of America

British Ecological Society

Cooper Ornithological Society

Ecological Society of America (Governing Board, Secretary, 2005-2010; President 2014-15)

Ecological Society of Japan

INTECOL (International Association for Ecology)

International Society of Hymenopterists

National Phenology Network (Board of Directors 2007 – 2011; Advisory Committee 2011-2015)

North American Pollinator Protection Campaign (Steering Committee 2001- ; Chair 2011- )

Rocky Mountain Biological Laboratory

Sigma Xi

Society for Conservation Biology

Society for the Study of Evolution

Society of American Naturalists

1. **Listserv lists I started and moderate**

ECOLOG-L (1992 – 2019), with > 20,000 subscribers, from >60 countries

ESANEWS (1994 - 2016)

ESASTUDENTS (2005 - 2015); moderated by a student member

BOMBUS-L (1997 - )

RMBLNATHIST (2014 - )

**5. Teaching and Advising**

**a. Courses taught in the last five years**

1. **Undergraduate**

BSCI 106: Principles of Biology II: Ecology and Evolution

BSCI 338Q: Conservation Laboratory

BSCI 361: Principles of Ecology

BSCI 363: The Biology of Conservation and Extinction

1. **Graduate**

BEES 899: Doctoral Dissertation Research

BIOL 662: Concepts in Animal Ecology

BIOL 899: Doctoral Dissertation Research

CONS 608: Seminar in Sustainable Development and Conservation Biology

CONS 609: Special Topics in Conservation Biology

CONS 670: Conservation Biology

CONS 680: Problem Solving in Conservation/Development

CONS 798: Research Papers in Sustainable Development and Conservation Biology

CONS 799: Masters Thesis Research

1. **University Honors, College Park Scholars, and other special programs.**

BSCI 399H: Honors Research (2 students)

HONR 238E: University Honors Program course: Science in the News and the News in Science

1. **Independent Study, Tutorial, Internship Supervision.**

Although they are not taken for credit, I helped supervise internships for about 16 M.S. students per year in the graduate program in Sustainable Development and Conservation Biology. (1990 – 2010)

1. **Other courses taught at the University of Maryland**

**Undergraduate**

Biology 101: Organization and Inter-relationship in the Biological World

Biology 106: Principles of Biology II (Ecology, evolution, behavior); Honors section too

BSCI 338S: Conservation Biology Laboratory

BSCI 361: Principles of Ecology

BSCI 363: The Biology of Conservation and Extinction

BSCI 399 and 399H: Biology Department Research

General Education 300: Perspectives on Nuclear War

Government and Politics 405: Defense Policy and Arms Control (co-taught)

Individual Studies Program 317

Zoology 212: Ecology, Evolution and Behavior

Zoology 308H: Honors Seminar

Zoology 309: Honors Independent Study

Zoology 312: The Biology of Conservation and Extinction

Zoology 318: Honors Research

Zoology 319: Special Problems in Zoology

Zoology 328A: Plant and Animal Coevolution, and Symbiosis

Zoology 328Z: Selected Topics in Zoology: Field Research

Zoology 470: Advanced Animal Ecology

Zoology 471: Laboratory and Field Ecology

Zoology 477: Symbiology

**Graduate**

Botany 899B: Doctoral Dissertation Research (Plant Ecology)

Biology 662: Concepts in Animal Ecology

LFSC 608: Scholarly Paper in Life Sciences

Marine, Estuarine and Environmental Sciences 799: Masters' Thesis Research

Marine, Estuarine and Environmental Sciences 899, Doctoral Dissertation Research

Zoology 608I: Microcomputers for Statistics and Graphics

Zoology 608J: Seminar in Ecology, Behavior and Evolution

Zoology 608L: Seminar in Ecology

Zoology 608Z: Microcomputing in Zoology Research

Zoology 609: Special Problems in Zoology

Zoology 670: Concepts in Animal Ecology

Zoology 674: Quantitative Field Ecology

Zoology 708L: Pollination Ecology

Zoology 708R: Seminar on the Biology of Small Populations

Zoology 799L: Masters' Thesis Research (Ecology)

Zoology 899L: Doctoral Dissertation Research (Ecology)

**b. Course or Curriculum Development**

General Education 300: Perspectives on Nuclear War – developed and taught this course

Helped develop curriculum for new graduate program in Sustainable Development and Conservation Biology, 1988-90.

Chair, Curriculum Committee for graduate program in Behavior, Ecology, Evolution and Systematics, 2000-01.

BSCI 338S: Developed new lab course in conservation biology, 2005.

HONR238E Honors Seminar: Science in the News and the News in Science, 2013.

**c. Manuals, Notes, Software, Webpages, and Other Contributions to Teaching**

I was PI on an NSF-funded workshop for college faculty on Plant Reproductive Biology, 1994-97, at the Rocky Mountain Biological Laboratory (Co-PIs Kearns, Thomson, Waser).

**d. Teaching at Other Institutions**

1. Faculty member, Advanced Field Ecology, University of MN, Lake Itasca Forestry and Biological Station

Faculty member, Field Ecology, Rocky Mountain Biological Laboratory.

Visiting faculty member, O.T.S. course 81-1, Costa Rica.

1986 Winter Ecology, Rocky Mountain Biological Laboratory

1987 Winter Ecology, Rocky Mountain Biological Laboratory

1989 Winter Ecology, Mountain Research Station

**e. Teaching Awards and Other Special Recognition**

1994 Outstanding teacher award, Celebrating Teachers program, University of Maryland

2004 Nominated for Distinguished Teacher-Scholar award, University of Maryland

2012 Teaching award from Maryland Book Exchange (nominated by student from BSCI 106)

2013 “Highly Commended” image in the BMC Ecology Image Competition

**f. Advising: Other Than Research Direction**

1. **Undergraduate**

I was a member of the Zoology advising team from Fall 1985 to Spring 1993, and was assigned an average of 69 students each semester.

**ii. Graduate**

I served from 1990 to 2010 as one of two advisors for students in the graduate program in Sustainable Development and Conservation Biology (approximately 16 new students each year).

**g. Advising: Research Direction**

1. **Undergraduate**

I have advised 3 undergraduate Honors students and served on committees of several others.

1. **Master's**

Judith Mohan M.S. 1981 Mutualism between ants and *Campsis radicans*

Sarah Miller M.S. 1982 Role of the wing-whistle in territoriality of Broad-tailed Hummingbirds

Stephen Vail M.S. 1983 Density effects in pollination and herbivory of *Potentilla gracilis*

David Jett M.S. 1984 Demographic consequences for voles of an insecticide

Amy Sheck M.S. 1985 Density effects in pollination of *Frasera speciosa*

Stefan Sommer M.S. 1986 Pollination and breeding system of *Hamamelis virginiana*

Ellen O'Callaghan M.S. 1994 Cost of reproduction in *Erythronium grandiflorum*

Laura Kay M.S. 1995 Reproductive biology and scent communication in captive Matschie's tree kangaroos (co-advised with C. Wemmer)

Wendy Lee M.S. 1997 Environmental control of flowering by *Androsace septentrionalis*

Michael Leigh M.S. 2007 Non-thesis

1. **Doctoral**

Carol Kearns Ph.D. 1990 The role of fly pollination in montane communities.

Joan Maloof Ph.D. 1999 The ecological effects of nectar robbers, with an emphasis on the reproductive biology of *Corydalis caseana.*

Francisca Saavedra Ph.D. 2000 Potential impact of climate change on the phenology and reproduction of *Delphinium nuttallianum* (Ranunculaceae).

Paul Callo Ph.D. 2002 The genetic distribution model of avian nest defense and the influence of predator identity on prey response. (co-advised with Gene Morton)

Garrett Lowe Ph.D. 2005 Bayberry fruit dispersal by neotropical migrants (co-advised with Lisa Petit)

Gary Dodge Ph.D. 2005 Ecological effects of the biocontrol insects, *Larinus planus* and *Rhinocyllus conicus*, on native thistles.

Tashi Wangchuk Ph.D. 2005 The evolution, phylogeography, and conservation of the golden langur (*Trachypithecus geei*) in Bhutan.

Colin Studds Ph.D. 2008 Non-breeding season biology in migratory birds (co-advised with Peter Marra (Smithsonian – National Zoo))

Judy Che-Castaldo Ph.D. 2011 Ecological interactions of the cadmium- and zinc-hyperaccumulating plant *Thlaspi caerulescens*, and their implications for phytoremediation

Sarah Rockwell Ph.D. 2013 Carry-over effects from the non-breeding season influence spring arrival dates, reproductive success, and survival in an endangered migratory bird, the Kirtland’s Warbler (*Setophaga kirtlandii*) (co-advised with Peter Marra)

1. **Postdoctoral advisees**

A. David McGuire 1989-90; now Professor, Alaska Cooperative Fish and Wildlife Research Unit, University of Alaska

Manuel Morales 1999-2001; now Assoc. Prof., Williams College

Abe Miller-Rushing 2007-08; now Science Coordinator for Acadia National Park

George Aldridge 2009-10; now consulting environmental scientist

Amy Iler (McKinney) 2010-14; now Conservation Scientist, Chicago Botanic Garden

Jane Ogilvie 2015-2018: now lab manager for Dr. Amy Iler

Rebecca Dalton 2018-2020: now employed at EPA

**6. Service**

**a. Professional**

**i. Offices and committee memberships held in professional organizations.**

American Association for the Advancement for Science

Organizing Committee, Mountain Research conference, Kyrgyzstan, 1996

Elected to Electorate Nominating Committee of the Section on Biological Sciences, 1997-2000, chair 1999-2000; Council Delegate (Section on Biological Sciences), 2001-2004

American Association of University Professors

Executive Committee, UMCP Chapter, 1986-87; Chair 1987-88

American Ornithologists' Union

started and manage AOUNET-L bulletin board, 1992 - ; renamed OCNET-L as of 1/98.

American Society of Naturalists

organizing committee for 1984 meeting

Botanical Society of America

judge for Best Student Paper at annual meeting

Ecological Society of America

Board of Editors, 1979-82; Vice-chair, Metropolitan Washington Chapter, 1986-87; Chair 1987-88; Editor, Technological Tools column, 1985-2004, Co-Editor, Emerging Technologies column, 2004 - ; Member, 1991-92, Committee on Human Resources in Ecology; started and moderate ESANEWS (1994 - ) listserv list, started ESASTUDENTS (2005); Special Committee on Ecological Society Communications in the Electronic Age, 1994 - 1995; Publications Committee, 1995 - 00; Historical Records Committee, 1995 - 09; Editor, Ecological Classics column (*Bulletin of the Ecological Society of America*), 2000 - 02; Publications Committee, *ad hoc* Subcommittee on Use Licenses, 2001; Secretary of the Governing Board, 2003 – 2009; Ecosystem Services Rapid Response Team, 2007- ; Elected to 3-year term as President-elect, President, and Past-President, terms beginning August 2013.

Encyclopedia of Life

Judge for Rubenstein Fellows program, 2011

Endangered Species Coalition, Scientific Advisory Board, 2010 –

Guild of Rocky Mountain Population Biologists

hosted annual meetings 1981, 1983

International Bee Research Association

Steering Committee, 1996 Costa Rican meeting

National Phenology Network, Organizing Committee, 2005 – 2007; Board of Directors 2007-

North American Pollinator Protection Campaign

Chair, Committee on Conservation & Restoration, 2001- ; hosted annual meeting 2003; Steering Committee member, 2001 - ; President of Steering Committee, 2011 -

Organization for Tropical Studies

Delegate from University of Maryland, 2006 - 2008

Rocky Mountain Biological Laboratory

Board of Trustees, 1977-88, 1991-2001; Treasurer, 1984-86; Vice-President, 1987; Secretary 1993-2000; Chair, Research Committee, 2003 - 06; member of several other committees.

Society for Conservation Biology

hosted 1999 annual meeting, College Park, MD

Society for the Study of Evolution

organizing committee for 1984 meeting

Task Force on Declining Pollination Services, of the Species Survival Commission of the IUCN (The World Conservation Union). 2002 -

1. **Reviewing activities for agencies**

Army Research Office (2011); Board of the Netherlands Foundation for the Advancement of Tropical Research (2002); Canon National Parks Science Scholars Program (AAAS); Center for Field Research; Council for International Exchange of Scholars; Czech Science Foundation (2016); Earthwatch; Fonds zur Förderung der wissenschaftlichen Forschung (Austrian Science Fund: 2002; 2004; 2013); National Academy of Sciences (USAID – Entomology panel); National Fish and Wildlife Foundation; National Geographic Society; National Science Foundation (19 panels since 1985, most recent - 2020); Natural Environment Research Council (UK: 2001); NSF-EPSCoR MONTS; Natural Environment Research Council (UK); NSERC (Canada); Secretariat for the Vancouver Island Marmot Recovery Programme; Smithsonian Institution; World Resources Institute.

2013: NSF Graduate Research Fellowship panel; Postdoctoral Research Fellowships in Biology – International Track. FONDECYT, research funding program of the Chilean National Commission for Scientific and Technological Research (CONICYT).

2017: Reviewer for: Swiss National Science Foundation; Fonds de la Recherche Scientifique - FNRS (F.R.S.-FNRS - Belgique); USDA National Institute of Food and Agriculture, Pollinator Health panel.

2018: Fonds de la Recherche Scientifique - FNRS (F.R.S.-FNRS - Belgique) – 2 proposals; Natural Environment Research Council (NERC; UK); NSF – GRFP; Israel Science Foundation; Velux Stiftung (2); US Fish & Wildlife Service, review of draft Species Status Assessment (SSA) Report for the Yellow-Banded Bumble Bee (*Bombus terricola*)

2019: Fonds de la Recherche Scientifique - FNRS (F.R.S.-FNRS - Belgique) – 3 proposals; Natural Environment Research Council (NERC; UK); Natural Sciences and Engineering Research Council of Canada (NSERC); Canada Research Chairs program; South African National Research Foundation.

2020: NSF (2 programs)

2021: NSF (2 programs); Professional Accomplishments and Evaluation Committee, Smithsonian Institution.

1. **Other unpaid services to local, State, and federal agencies**

Maryland State Environmental Research Guidance Committee (1978-81)

Review Committee for researcher at Smithsonian Environmental Research Center (2004)

Search Committee for Director of the National Phenology Network (USGS; 2006-2007).

MD Commission on Climate Change, Forests & Terrestrial Ecosystems Subgroup (2009-2011)

Presentation to Town Council, Crested Butte, CO (2016)

Stakeholder representative, molecular insect systematist job search, USDA-ARS-PWA Pollinating Insect­­ Biology, Mgmt. Syst.­­ Research Unit, Logan, UT (2016)

1. **Other non-University of Maryland committees, commissions, panels, etc.**

External examiner for doctoral candidate, University of California, Irvine, 1980

External examiner for doctoral candidate, Carleton University (Ottawa), 2016

Outside reviewer for Biology Department, William Paterson College, 1996

Outside reviewer for Biology Department, Colorado College, 1997

Reviewer for tenure decision, SUNY Stony Brook (1987)

Reviewer for tenure decision, Iowa State University (1988)

Reviewer for tenure decision, Middlebury College (2002)

Science/Technology Merit Review Panel for the year 2002 National Security Education Program (NSEP) David L. Boren Graduate Fellowships

Reviewer for promotion decision, U. C. Berkeley (2004)

Reviewer for tenure decision, University of Virginia (2006)

Reviewer for tenure decision, UC Merced (2011)

Reviewer for Environmental Management Certificate Program, University of Washington (2007)

Reviewer for Commission on Higher Education, United Arab Emirates (2008)

Steering Committee for Agroecosystem Workshop (2010-11); American Society of Agronomy (ASA), Crop Science Society of America (CSSA), Soil Science Society of America (SSSA), Ecological Society of America (ESA) and Council on Food, Agricultural, and Resource Economics (C-FARE).

Reviewer for Encyclopedia of Life Rubenstein Fellows program (2011)

Reviewer for two Habilitation candidates, University of Vienna (2011)

Reviewer for promotion decision, Grinnell College (2012)

Reviewer for reappointment decision, Stanford University (2012)

Member of the 25 x ’25 Adaptation Initiative (2011-13)

Member, Corn Dust Research Consortium (2013-2017)

Reviewer for pre-tenure consideration, Emory University (2014)

Reviewer for Presidential Pollinator Health Task Force (USGS; 2015)

Reviewer for tenure decision, UC Berkeley (2017); promotion decision, Old Dominion University (2017)

External examiner for honours thesis, University of New England, Armidale, Australia (2019)

1. **International activities not listed above**

Research trips for field work in Austria, Australia, Costa Rica, New Zealand, Panama, South Africa

**vii. Paid and unpaid consultancies**

British Broadcasting Corporation, Natural History Unit (1984)

Isaak Walton League of America, Sustainability Education Program (climate change project) (2006)  
Nature Conservancy, Denver, Colorado (1985)

Macmillan Educational Co., New York (1986)

Reviewer for National Geographic Society (1991, 1992)

Reviewer for Saunders College Publishing (1992-1993)

Reviewer for Mosby Year Book publishers (1994)

National Park Service: habitat management plan for butternut trees in the George Washington Memorial Parkway (1996-1997)

National Geographic Society, consultant on children’s books about insects (1996-1997), Animals in your backyard (1999), an encyclopedia about animals (1999), and children's books about insects (1999-2000, 2002-03) and wildflowers (2017)

North Dakota State University, consultant on new graduate program in Environmental and Conservation Sciences (2001)

Reviewer of Species Assessment plans for US Forest Service Rocky Mountain region (2003-2006)

Advisory Board, Discovery Creek Children's Museum of Washington, D.C. (2004 - 2006)

University of Washington, consultant on new graduate program in conservation biology (2005)

U.S. Fish and Wildlife Service, science panel member for the *Lepidium papilliferum* Decision Support Workshop (2006); consultant on new information and analyses (2009)

Audubon Magazine (2007)

Native Pollinator Initiative, project Steering Committee (2007)

MacArthur Fellows Program (2006, 2007)

University of Chicago Press (2009)

Reviewer for Wiley-Blackwell (book proposal) (2011)

Climate Change and Forests Workgroup, Climate Change Adaptation program, Office for a Sustainable Future, Maryland Department of Natural Resources (2012)

Reviewer for U.S. Fish and Wildlife Service; documents related to protection of pollinators for rare plants in Colorado (2012)

Consultant for *Celebra los Colibríes* (Celebrate Hummingbirds) (2011- )

**b. Campus**

1. **Departmental**

Many departmental committees, 1976 – present

Coordinator of Dept. Honors Program, 1987-88, 1990-92

Chair, promotion committee for candidate for Professor, 2005, 2012

Director of Graduate Studies, Department of Biology, 2012-

Associate Chair, Department of Biology, 2012 -

1. **College**

Dean’s Committee for Undergraduate Education, 1991-1992

College Advisory Committee, 1993-1994

Search Committee for Campus Computing Associate, 1993-1994

Search Committee for Entomology Department Chair, 1993-1994

Study Area Committee for BIOL 106, 1995-1996

Programs, Courses and Curricula Committee, 1998

Research Training Grant Steering Committee, 1999

Curriculum Committee Chair, BEES graduate program, 2000-2001

Council of Graduate Directors, 2000-01, 2002- 2010

Committee on Appointments, Promotions, and Tenure, 2003-2005

Review Committee for Dorfman prize, 2013

1. **University**

Member of University Speakers Bureau, 1977-

American Association of University Professors (Executive Committee, UMCP Chapter, 1986-87; Chair 1987-88)

College Park Environmental Council 1998-2000

Computer classroom design committee 1992-93

Environmental Sciences committee 1992-93

Biodiversity Program committee 1992-93

Graduate Council, 2012-15

Graduate Council Committee on Fellowships, 1994-97

Freshman Book Selection Committee 1994

Faculty Subcommittee of the Asian, Hispanic and Native American Task Force, 1994

University Library Council 1999-2001

Review Committee for Director of the Environmental Science and Policy Program, 2003-04

**iv. Special administrative assignments**

Director, Graduate Program in Sustainable Development and Conservation Biology 1990 – 2010

Program awarded the Instructional Unit Minority Achievement Award by the President’s Commission on Ethnic Minority Issues, 2004 – 2005

Campus coordinator for Organization for Tropical Studies, 2006 – 2007

University of Maryland Climate Action Plan Workgroup, 2007 – 2008

International Programs Major Initiatives Committee, 2007 – 2008

Negotiated Masters International Program agreement with Peace Corps, 2007

1. **Community, State, National**

Consultant, Howard County Gifted and Talented Student Program, 1977, 1979, 1985-1987

Reference person for Washington Apple Pi (Apple Computer Users Group) 1982-1984

Instructor for Washington Apple Pi (Apple Computer Users Group), 1983

ACLU, Prince George's County Chapter Executive Board, 1984-1988

Speaker for the Center on the Consequences of Nuclear War, 1985-1993

Zero Population Growth Education Training Network, Speakers Network 1987-1999

Advisory Board, Center for Educational Leadership, New York Urban Coalition 1990-1994

Participant in MentorNet, 2004-2006

25 x 25’ Adaptation Working Group (2011 – 2013)

Expert Panel: Global Warming Impacts to Farming and Food Security on the West Slope, 2015

Citizens for a Healthy Community (Paonia, Colorado), Governing Board 2016 –

Hummingbird sub-committee of the North American Banding Council, 2018

1. **Service Awards and Honors**
2. Volunteer of the Year Award, Rocky Mtn. Biological Laboratory
3. Distinguished International Service Award, University of Maryland

2010 Ecological Society of America, recognition for six years of service as Board Secretary

2016 Ecological Society of America, recognition for service as President