

**CURRICULUM VITAE**  
**JOHN EDWARD BANKS**

Director, Undergraduate Research Opportunities Center (UROC)  
California State University, Monterey Bay  
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**EDUCATION:**

Ph.D. Zoology, University of Washington, Seattle, WA, 1997. “The effects of landscape heterogeneity on insect populations: a study of pattern and scale”.

M.S. Applied Mathematics, University of Southern California, Los Angeles, CA, 1990. “A numerical scheme for approximating a partial differential equation model for fish population dynamics.”

B.A. Mathematics, Pomona College, Claremont, CA, 1986.

**ADMINISTRATIVE POSITIONS:**

Director of the Undergraduate Research Opportunities Center (UROC), California State University Monterey Bay, 2015-present.

Project Director, Ronald E. McNair Postbaccalaureate Achievement (McNair) Program, California State University, Monterey Bay, 2015-present.

Campus co-coordinator, subaward PI, and member of Program Oversight Committee, CSU Louis Stokes Alliance for Minority Participation (LSAMP) program, California State University, Monterey Bay, 2015-present.

Director of Office of International Programs (OIP), University of Washington, Tacoma, 2010 – 2015.

Director of Office of Undergraduate Education (OUE), University of Washington, Tacoma, 2011-2013.

Assistant Director, Interdisciplinary Arts & Sciences, University of Washington, Tacoma, 2011-2013.

Campus Coordinator, Restoration Ecology Network, University of Washington, Tacoma, 2000-2012.

**TEACHING/RESEARCH/PROFESSIONAL APPOINTMENTS:**

Science Policy Fellow, Entomological Society of America, 2018-2020.

August T. Larsson Guest Researcher, Swedish University of Agricultural Sciences (SLU), Uppsala, Sweden 2014-2017. Member of the *Ecosystem Services & Conservation Research group*.

Affiliate Professor of Environmental Science, Interdisciplinary Arts & Sciences, University of Washington, Tacoma, 2015-present.

Professor of Environmental Science, Interdisciplinary Arts & Sciences, University of Washington, Tacoma, 2010-2015.

Associate Professor of Environmental Science, Interdisciplinary Arts & Sciences, University of Washington, Tacoma, 2005–2010.

Assistant Professor of Environmental Science, Interdisciplinary Arts & Sciences, University of Washington, Tacoma, 1999–2005.

Affiliate Associate Professor, Department of Plant, Soil & Entomological Sciences, University of Idaho, 2010-present.

Associate Adjunct Professor of Forest Resources - University of Washington, Seattle, 2010-present.

Affiliate Member, Invertebrate Section, Department of Zoology, National Museums of Kenya, 2010-present.

Adjunct Faculty - Washington State University, Department of Entomology, 1999-present.

Instructor: University of Washington, Tacoma Liberal Studies Program, Winter 1999, Autumn 1997; University of Puget Sound, Biology Department, Spring 1998; Rocky Mountain Biological Laboratory: Applied Ecology and Conservation Biology, Summer 1997; University of Maryland (European Division--Germany): Mathematics (Introductory Algebra, Trigonometry, Pre-Calculus, Statistics), 1990-1991.

## **PUBLICATIONS:**

\* undergraduate co-author

\*\* graduate student co-author

## **Peer-reviewed articles:**

Banks, J.E., Banks, H.T., Myers, N., Laubmeier, A.N., and R. Bommarco. 2020. Lethal and sublethal effects of toxicants on bumble bee populations: a modelling approach. *Ecotoxicology* Accepted.

Banks, H.T., Banks, J.E., Catenacci, J., Joyner, M.L., and J.D. Stark. 2020. Correctly modeling plant-insect-herbivore-pesticide interactions as aggregate data. *Mathematical Biosciences and Engineering* 17(2): 1743-1756. <https://doi.org/10.3934/mbe.2020091>

- Banks, J.E., Laubmeier, A.N, and H.T. Banks. 2020. Modelling the effects of field spatial scale and natural enemy colonization behaviour on pest suppression in diversified agroecosystems. *Agricultural and Forest Entomology* 22(1): 30-40.  
<https://doi.org/10.1111/afe.12354>
- Stark, J.D., and J.E. Banks. 2019. Comparative toxicity of the semi-natural insecticide Spinetoram (Delegate™) to three Cladoceran species. *Biopesticides International* 15(1): 1- 4.
- Banks, H.T., Banks, J.E., Cody, N.G., Hoddle, M.S., and A.E. Meade. 2019. Population model for the decline of *Homalodisca vitripennis* (Hemiptera: Cicadellidae) over a ten-year period. *Journal of Biological Dynamics* 13(1):422-446.  
<https://doi.org/10.1080/17513758.2019.1616839>
- Banks, J.E., Ackleh, A.S., Veprauskas, A., and J.D. Stark. 2019. The trouble with surrogates in environmental risk assessment: a daphniid case study. *Ecotoxicology* 28: 62-68.  
<https://doi.org/10.1007/s10646-018-1999-0>.
- Curtsdotter, A., Banks, H.T., Banks, J.E., Jonsson, M., Jonsson, T., Laubmeier, A.,\*\*, Traugott, M., and R. Bommarco. 2019. Ecosystem function in predator-prey food webs -- confronting dynamic models with empirical data. *Journal of Animal Ecology* 88(2): 196-210. <https://doi.org/10.1111/1365-2656.12892>.
- Haeger, H., Fresquez, C., Smith, C., and J. E. Banks. 2018. Navigating the academic landscape: How undergraduate research experiences can shed light on the hidden curriculum. *Scholarship and Practice of Undergraduate Research* 2(1): 15-23.  
<https://doi.org/10.18833/spur/2/1/7>.
- Banks, J.E., Fresquez, C., Haeger, H., Quinones-Soto, S., and L. Hammersley. 2018. Alliance for change: Broadening participation in undergraduate research at California State University. *Scholarship and Practice of Undergraduate Research* 1(4): 5-11.
- Laubmeier, A.N., Wootton, K., Banks, J.E., Bommarco, R., Curtsdotter, A., Jonsson, T., Roslin, T., and H. T. Banks. 2018. From theory to experimental design - quantifying a trait-based theory of predator-prey dynamics. *PLoS ONE* 13(4): e0195919.  
<https://doi.org/10.1371/journal.pone.0195919>
- Banks, H.T., Everett, R., Murad, N., White, R., Banks, J.E., Cass, B., and J. Rosenheim. 2018. Optimal design for dynamical modeling of pest populations. *Mathematical Biosciences and Engineering* 15(4): 993-1010.
- Veprauskas, A., Ackleh, A.S., Banks, J.E., and J.D. Stark. 2018. The evolution of toxicant resistance in daphniids and its role on surrogate species. *Theoretical Population Biology* 119: 15-25.
- Banks, J.E., Vargas, R.I., Ackleh, A.S., and J.D. Stark. 2017. Sublethal effects in pest management: a surrogate species perspective on fruit fly control. *Insects* 83 (3):78 (Invited, Special Issue: Arthropod pest control in orchards).

- Banks, J.E., Jackson, C.H.W., Gagic, V., Baya, A., and D. Ngala. 2017. Differential responses of bird species to habitat condition in a coastal Kenyan forest reserve: implications for conservation. *Tropical Conservation Science* 10: 1-13.
- Banks, H.T., Banks, J.E., Bommarco, R., Laubmeier, A.N., Myers, N.J., Rundlöf, M., and K. Tillman. 2017. Analysis of nonlinear delay systems with applications in bumblebee population models. *Communications in Applied Analysis* 21(3): 449-476.
- Banks, H.T., Banks, J.E., Bommarco, R., Curtsdotter, A., Jonsson, T., and A.N. Laubmeier. 2017. Parameter estimation for an allometric food web model. *International Journal of Pure & Applied Mathematics* 114(1):143-160.
- Banks, J.E. and J.J. Gutiérrez. 2017. Undergraduate research in international settings: synergies in stacked high-impact practices. *CUR Quarterly* 37(3): 18-26.
- Banks, H.T., Banks, J.E., Bommarco, R., Laubmeier, A.N., Myers, N.J., Rundlöf, M., and K. Tillman. 2017. Modeling bumble bee population dynamics with delay differential equations. *Ecological Modelling* 351: 14-23.
- Hudson, L. N., Newbold, T., Contu, S., Hill S. L. L., Lysenko, I., De Palma A., ...Banks, J.E.,... Purvis, A. 2017. The database of the PREDICTS (Projecting Responses of Ecological Diversity In Changing Terrestrial Systems) project. *Ecology and Evolution* 7: 145-188. doi: 10.1002/ece3.2579.
- Oehlman, N., Haeger, H., Clarkston, B., and J.E. Banks. 2016. Maximizing the function of e-Portfolios. *Peer Review* 18(3).
- Banks, J.E., and V. Gagic. 2016. Aphid parasitoids respond to vegetation heterogeneity but not to fragmentation scale: an experimental field study. *Basic and Applied Ecology* 17(5): 438-446.
- Banks, H.T., Banks, J.E., Rosenheim, J.A., and K. Tillman. 2016. Modelling populations of *Lygus hesperus* on cotton fields in the San Joaquin Valley of California: the importance of statistical and mathematical model choice. *Journal of Biological Dynamics* <http://dx.doi.org/10.1080/17513758.2016.1143533>
- Banks, H.T., Banks, J.E., Murah, N., Rosenheim, J., and K. Tillman. 2016. Modelling pesticide treatment effects on *Lygus hesperus* in cotton fields, in Bociu, L., Desideri, J.A., and A. Habbal (eds.) Technology (IFIP AICT Series) System Modeling and Optimization (CSMO 2015), IFIP Advances in Information and Communication, Springer Press.
- Stark, J.D. and J.E. Banks. 2016. Developing demographic toxicity data: Optimizing effort for predicting population outcomes. *PeerJ* 4:e2067 <https://peerj.com/articles/2067/>
- Banks, H.T., Banks, J.E., Everett, R.A., and J.D. Stark. 2016. An adaptive feedback methodology for determining information content in stable population studies. *Mathematical Biosciences and Engineering* 13(4): 653-671.

- MacFarlane, D.W., Kinzer\*\*, A., and J.E. Banks. 2015. Coupled human-natural regeneration of indigenous coastal dry forest in Kenya. *Forest Ecology & Management* 354:149-159.
- Banks, J.E., Banks, H.T., Rinnavatore, K.\*\* and C. Jackson. 2015. Optimal sampling frequency and timing of threatened tropical bird populations: a modeling approach. *Ecological Modelling* 303: 70-77.
- Stark, J.D., Vargas, R.I. and J.E. Banks. 2015. Incorporating variability in point estimates in risk assessment: bridging the gap between LC<sub>50</sub> and population endpoints. *Environmental Toxicology and Chemistry* 34(7):1683-1688.
- Banks, H.T., Banks, J.E., Link, K.\*\*, Rosenheim, J.A., Ross, C.\*\*, and K.A. Tillman\*\*. 2015. Model comparison tests to determine data information content. *Applied Mathematics Letters* 43: 10-18.
- Hudson, L. N., Newbold, T., Contu, S., Hill, S. L. L., Lysenko, I., De Palma, A., Phillips, H. R. P., Senior, R. A., Bennett, D. J., Booth, H., Choimes, A., Correia, D. L. P., Day, J., Echeverría-Londoño, S., Garon, M., Harrison, M. L. K., Ingram, D. J., Jung, M., Kemp, V., Kirkpatrick, L., Martin, C. D., Pan, Y., White, H. J., Aben, J., Abrahamczyk, S., Adum, G. B., Aguilar-Barquero, V., Aizen, M. A., Ancrenaz, M., Arbeláez-Cortés, E., Armbrrecht, I., Azhar, B., Azpiroz, A. B., Baeten, L., Báldi, A., Banks, J. E., *et al.* 2014. The PREDICTS database: a global database of how local terrestrial biodiversity responds to human impacts. *Ecology and Evolution* <https://doi.org/10.1002/ece3.1303>
- Banks, J.E., Hannon, L.M.\*\*, Dietsch, T.V., and M. Chandler. 2014. Effects of seasonality and farm proximity to forest on Hymenoptera in Tarrazú coffee farms. *International Journal of Biodiversity Science, Ecosystem Services & Management* 10(2): 128-132.
- Banks, J.E., Stark, J.D., Vargas, R.I., and A.S. Ackleh. 2014. Deconstructing the surrogate species concept: a life history approach to the protection of ecosystem services. *Ecological Applications* 24:770-778.
- Macfadyen, S., Banks, J.E., Stark, J.D., Davies, A.P. 2014. Using semifield studies to examine the effect of pesticides on mobile terrestrial invertebrates. *Annual Review of Entomology* 59: 383-404.
- Castro, S., Flores, M., Wanner, N.\*\*, Dietsch, T., Banks, J.E., Urena, N., and M. Chandler. 2014. Evaluation of a non-destructive sampling method and a statistical model for predicting fruit load on individual coffee (*Coffea arabica*) trees. *Scientia Horticulturae* 167:117-126.
- Vargas, R.I., Stark, J.D., Banks, J.E., Leblanc, L., Manoukis, S., and S. Peck. 2013. Spatial dynamics of two Oriental fruit fly (Diptera: Tephritidae) parasitoids, *Fopius arisanus* (Sonan) and *Diachasmimorpha longicaudata* (Ashmead) (Hymenoptera: Braconidae), in a guava orchard in Hawaii. *Environmental Entomology* 42(5): 888-901.
- Banks, J.E., Hannon, L\*\*, Hanson, P., Dietsch, T., Castro, S.\*\*, Urena, N., and M. Chandler. 2013. Effects of proximity to forest habitat on hymenoptera diversity in a Costa Rican coffee agroecosystem. *The Pan-Pacific Entomologist* 89(1): 60-68.

- Banks, J.E., Jackson, C., Baya, A., Minella, H.\*, Nitz, M.\*, Hitchcock, J.\*, and D. Bruinsma\*\*. 2012. Forest type preference of an Afrotropical thrush (East Coast Akalat, *Sheppardia gunningi sokokensis*) in Arabuko-Sokoke Forest, Kenya. *Ostrich* 83(2): 105-108.
- Banks, J.E., Stark, J.D., Vargas, R.I., and A.S. Ackleh. 2011. Parasitoids and ecological risk assessment: Can toxicity data developed for one species be used to protect an entire guild? *Biological Control* 59: 336-339.
- Banks, J.E., and J.D. Stark. 2011. Effects of a nicotinic insecticide, Imidacloprid and vegetation diversity on movement of a common predator *Coccinella septempunctata*. *Biopesticides International* 7(2): 113-122.
- Banks, J.E., Cline, E., Castro, S., Ureña, N., Nichols, N., Hannon, L.\*, Singer, R.\*, and M. Chandler. 2011. Effects of synthetic fertilizer on coffee yields and ecosystem services: parasitoids and soil glomalin in a Costa Rican coffee agroecosystem. *Journal of Crop Improvement* 25: 650-663.
- Stark, J.D. and J.E. Banks. 2011. Evaluating the effects of pesticides on target and non-target organisms: population-level approaches and models. *Biopesticides International* 7(2): 71-81.
- Banks, J.E., Jackson, C., Hannon\*, L.M., Thomas\*, C.M., Baya, A., and L. Njoruge. 2010. The cascading effects of elephant presence/absence on arthropods and an Afrotropical thrush in Arabuko-Sokoke Forest, Kenya. *African Journal of Ecology* 48(4): 1030-1038.
- Banks, J.E., Ackleh A.S., and J.D. Stark. 2010. The use of surrogate species in risk assessment: using life history data to safeguard against false negatives. *Risk Analysis* 30: 175-182.
- Banks, H.T., Banks, J.E. and S. L. Joyner\*\*. 2009. Estimation in time-delay modeling of insecticide-induced mortality. *Journal of Inverse and Ill-posed Problems* 17:101-125.
- Banks, J.E., Bommarco, R., and B. Ekbom. 2008. Population response to resource separation in Conservation Biological Control. *Biological Control* 47: 141-146.
- Banks, H.T, Banks, J.E., Joyner, S.L.\*\*, and J.D. Stark. 2008. Dynamic models for insect mortality due to exposure to insecticides. *Mathematical and Computer Modelling* 48: 316-332.
- Banks, J.E., Dick, L.K., Banks, H.T., and J.D. Stark. 2008. Time-varying vital rates in ecotoxicology: selective pesticides and aphid population dynamics. *Ecological Modelling* 210: 155-160.
- Banks, H.T., Banks, J.E., Dick, L.K., and J.D. Stark. 2007. Estimation of dynamic rate parameters in insect populations undergoing sublethal exposure to pesticides. *Bulletin of Mathematical Biology* 69: 2139-2180.
- Stark, J.D.,Vargas, R., and J.E. Banks. 2007. Incorporating ecologically relevant measures of pesticide effect for estimating the compatibility of pesticides and biocontrol agents. *Journal of Economic Entomology* 100: 1027-1032.

- Banks, J.E., Sandvik, P.J.\*, and L. Keesecker\*. 2007. Beetle (Coleoptera) and spider (Araneae) diversity in a mosaic of farmland, edge, and tropical forest habitats in western Costa Rica. *Pan-Pacific Entomologist* 83(2): 152-160.
- Kramarz, P., Banks, J.E., and J.D. Stark. 2007. Density-dependent response of the pea aphid (Hemiptera: Aphididae) to imidacloprid. *Journal of Entomological Science* 42: 200-206.
- Gold, W., Ewing, K., Banks, J.E., Groom, M., Hinckley, T., Secord, D., and D. Shebitz\*\*. 2006. Collaboration in restoration ecology. *Science* 312 (5782): 1880-1881.
- Adams, B.M.\*\*\*, Banks, H.T., Banks, J.E., and J.D. Stark. 2005. Population dynamics models in plant-insect herbivore-pesticide interactions. *Mathematical Biosciences* 196: 39-64.
- Banks, J.E. 2004. Divided culture: integrating agriculture and conservation biology. *Frontiers in Ecology & the Environment* 2(10): 537-545.
- Banks, J.E. and J.D. Stark. 2004. Aphid response to vegetation diversity and insecticide applications. *Agriculture, Ecosystems, and Environment* 103(3): 595-599.
- Stark, J.D., Banks, J.E., and R.I. Vargas. 2004. How risky is risk assessment? The role that life history strategies play in susceptibility of species to pesticides and other toxicants. *Proceedings of the National Academy of Sciences* 101:732-736.
- Stark, J.D., Banks, J.E. and S. Acheampong\*\*. 2004. Estimating susceptibility of biological control agents to pesticides: influence of life history strategies and population structure. *Biological Control* 29: 392-398.
- Banks, J.E. and C.L. Yassenak\*. 2003. Effects of plot vegetation diversity and spatial scale on *Coccinella septempunctata* movement in the absence of prey. *Entomologia Experimentalis et Applicata* 108:197-204.
- Bommarco, R. and J.E. Banks. 2003. Scale as modifier in vegetation diversity experiments: effects on herbivores and predators. *Oikos* 102: 440-448.
- Stark, J.D. and J.E. Banks. 2003. Population-Level Effects of Pesticides and Other Toxicants on Arthropods. *Annual Review of Entomology* 48: 505-519.
- Stark, J.D., and J.E. Banks. 2002. Response from Stark & Banks. *BioScience* 52: 216.
- Stark, J.D. and J.E. Banks. 2001. "Selective pesticides": are they less hazardous to the environment? *Bioscience* 51: 980-982.
- Rämert, B., Hellqvist, S., Ekbom, B., and J. E. Banks. 2001. Assessment of trap crops for *Lygus* spp. in lettuce. *International Journal of Pest Management* 47: 273-276.
- Banks, J.E. 2000. Effects of weedy field margins on *Myzus persicae* (Hemiptera: Aphididae) in a broccoli agroecosystem. *Pan-Pacific Entomologist* 76: 95-101.
- Banks, J.E. and J.D. Stark. 2000. The interplay of agroecosystem diversity and pesticide use. *Pesticide Outlook* 11: 48-50.

- Banks, J.E. 1999. Differential response of two agroecosystem predators, *Pterostichus melanarius* (Coleoptera: Carabidae) and *Coccinella septempunctata* (Coleoptera: Coccinellidae), to habitat composition and fragmentation scale manipulations. *The Canadian Entomologist* 131: 645-658.
- Banks, J.E. and B. Ekbom. 1999. Modeling herbivore movement and colonization: pest management potential of intercropping and trap cropping. *Agricultural and Forest Entomology* 1:135-140
- Banks, J.E. 1998. The scale of landscape fragmentation influences herbivore response to vegetation heterogeneity. *Oecologia* 117: 236-246.
- Banks, J.E. and J.D. Stark. 1998. What is ecotoxicology? An ad-hoc grab bag or an interdisciplinary science? *Integrative Biology* 5:1-9.
- Banks, J.E. 1997. Do imperfect tradeoffs affect the extinction-debt phenomenon? *Ecology* 78(5): 1597-1601.
- Holmes, E.E., Lewis, M.A., Banks, J.E., and D. Veit. 1994. Partial differential equations in ecology: spatial interactions and population dynamics. *Ecology* 75: 17-29.

#### **Invited Book chapters, reviews, and technical reports:**

- Banks J.E., Njoroge L., Jackson C., Reyes-Gallegos E.\*, Ochieng J. 2019. A list of coleoptera recorded in Mixed Forest habitat in Arabuko-Sokoke Forest, Kenya. Version 1.4. A Rocha Kenya. Sampling event dataset <https://doi.org/10.15468/skclrl> accessed via GBIF.org on 2019-03-31
- H.T. Banks, H.T., Banks, J.E., Catenacci, J., Joyner, M.L., and J.D. Stark. 2019. Comparison of dynamic models for plant-insect herbivore-pesticide interactions CRSC-TR19-11, Center for Research in Scientific Computation, N. C. State University, Raleigh, NC.
- H.T. Banks, Banks, J.E., Murad, N., Rosenheim, J.A. and K. Tillman. 2017. Modelling pesticide treatment effects on *Lygus hesperus* in cotton fields, Proceedings, 27 th IFIP TC7 Conference 2015 on System Modelling and Optimization, L. Bociu et al (Eds.) CSMO 2015 IFIP AICT 494, p.1–12, Springer.
- Banks, J.E, Stark, J.D., Vargas, R.I., Veprauskas, A., and A. Ackleh. 2017. Protecting assemblages of biocontrol species: Modeling a surrogate species approach. In Mason, P.G., Gillespie, D.R., and C. Vincent (eds.) Proceedings of the 5th International Symposium on Biological Control of Arthropods. CABI International, Oxfordshire, UK, pp. 175-177.
- Vargas, R.I., Souder, S., Leblanc, L., Banks, J.E., and J.D. Stark. 2017. Integration of biopesticides with natural enemies for control of tropical fruit flies (Diptera: Tephritidae). In Mason, P.G., Gillespie, D.R., and C. Vincent (eds.) Proceedings of the 5th International Symposium on Biological Control of Arthropods. CABI International, Oxfordshire, UK, pp. 172-174.



- Stark, J.D., Banks, J.E., and R.I. Vargas. 2017. How differential stage susceptibility to pesticides affects the success of biocontrol agents. In Mason, P.G., Gillespie, D.R., and C. Vincent (eds.) Proceedings of the 5th International Symposium on Biological Control of Arthropods. CABI International, Oxfordshire, UK, pp. 164-166.
- Banks, H.T., Banks, J. E. , Bommarco, R., Curtsdotter, A., . Jonsson, T., and A. N. Laubmeier. 2016. Parameter estimation for an allometric food web model. Center for Research in Scientific Computation Report, North Carolina State University. CRSC-TR16-03.
- Banks, H.T., Banks, J.E., Murad, N., Rosenheim, J.A., and K. Tillman. 2015. Modelling pesticide treatment effects on *Lygus hesperus* in cotton fields. CRSC-TR15-09, Center for Research in Scientific Computation, N. C. State University, Raleigh, NC.
- Banks, H.T., Banks, J.E. Rosenheim, J.A., and K. Tillman\*\*. 2015. Modelling populations of *Lygus hesperus* on cotton fields in the San Joaquin valley of California: The importance of statistical and mathematical model choice. Center for Research in Scientific Computation Report, North Carolina State University. CRSC-TR15-04.
- Banks, H.T., Banks, J.E., Link, K., Rosenheim, J.A., Ross, C.\*\* , and K.A. Tillman.\*\* 2014. Model comparison tests to determine data information content. Center for Research in Scientific Computation Report, North Carolina State University. CRSC-TR14-13.
- Banks, J.E., Banks, H.T., Rinnovatore, K\*\*, and C.M. Jackson. 2014. Optimal sampling frequency and timing of threatened tropical bird populations: A modeling approach. Center for Research in Scientific Computation Report, North Carolina State University. CRSC-TR14-03.
- Banks, H.T., Banks, J.E., Jackson, C., and K. Rinnavotore\*\*. 2013. Modeling the East Coast Akalat population: Model comparison and parameter estimation. Center for Research in Scientific Computation Report, North Carolina State University. CRSC-TR13-12.
- Banks, J.E., Ackleh, A.S., and J.D. Stark. 2012. Population models & data in applied ecology: Surrogate species. In Kojima, F., Kobayashi, F. & H. Nakamoto (eds.) Simulation and Modeling related to Computational Science and Robotics Technology (Proceedings Series). IOS Press, Amsterdam, Netherlands. pp. 34-43.
- Banks, J.E. and J.D. Stark. 2009. Ecotoxicology: life history data and population models, In Santos, E.B. (ed.) Ecotoxicology Research Developments, Nova Science Publishers, Inc.
- Banks, H.T., Banks, J.E., and S. L. Joyner\*\*. 2008. Estimation in time-delay modeling of insecticide-induced mortality. Center for Research in Scientific Computation Report, North Carolina State University, CRSC-TR08-15.
- Banks, H.T., Banks, J.E., Joyner, S.L.\*\* , and J.D. Stark. 2007. Dynamics models for insect mortality due to exposure to pesticides. Center for Research in Scientific Computation Report, North Carolina State University.
- Banks, J.E. 2006. Population Ecology: First Principles (Invited Book Review). *Environmental Entomologist*. 35(3): 811.

- Banks, H.T., Banks, J.E., Dick, L.K.\*\*\*, and J.D. Stark. 2005. Estimation of dynamic rate parameters in insect populations undergoing sublethal exposure to pesticides. Technical Report (TRO5-22), Center for Research in Scientific Computation, North Carolina State University.
- Banks, J.E. 2003. The War on Weeds: an environmental history (Invited Book Review). *Pacific Northwest Quarterly* 94: 214-215.
- Banks, J.E. 2003. Influence of plant diversity on herbivores and their natural enemies, In Koul, O. & G.S. Dhaliwal (eds.) *Predators and Parasitoids* (Advances in Biopesticide Research Series), Taylor & Francis, London. pp. 111-120.
- Adams, B.M., Banks, H.T., Banks, J.E., and J.D. Stark. 2003. Population dynamics models in plant-insect herbivore-pesticide interactions. Technical Report, Center for Research in Scientific Computation, North Carolina State University.
- Banks, J.E. 2002. Agricultural ecology (definition/essay). McGraw-Hill Yearbook of Science & Technology.
- Banks, J.E. 2001. Population Stability and Regulation: Insights from the Interface of Laboratory Data and Models (Invited Book Review). *Ecology* 82: 3269-3270.
- Banks, J.E. 2000. Natural vegetation in agroecosystems: pattern and scale of heterogeneity. In Ekbom, B., M. Irwin & Y. Robert (eds.) *Interchanges of insects between agricultural and surrounding landscapes*. Kluwer Press, Dordrecht. pp. 215-229.
- Stark, J.D. and J.E. Banks. 2000. The toxicologists's and ecologists' point of view - unification through a demographic approach. In Kammenga R. & R. Laskowski (eds.) *Demography in Ecotoxicology*. Wiley & Sons, Ltd. Chichester. pp. 9-23.
- Banks, J.E. 1999. Collaborations in ecology: a solo science becomes less lonely. *Bulletin of the Ecological Society of America* 80: 85-86.
- Winterer, J., Klepetka, B., Banks, J., and P. Kareiva. 1994. Strategies for minimizing the vulnerability of rice to pest epidemics. In Teng, P.S., Heong, K.L., Moody, K.,(eds.) *Rice Pest Science and Management. Selected papers from the International Rice Research Conference*. International Rice Research Institute, Manila, Philippines. pp. 53-69.

#### **INVITED TALKS (since 2004):**

- Invited Symposium talk “Modelling the effectiveness of parasitoid biological control on *B. dorsalis* in Sénégal, West Africa “, He pua no ka wēkiu: Honoring the Life and Work of Roger Vargas, Annual Meeting of the Entomological Society of America, St. Louis, Missouri, November, 2019.
- Invited Symposium talk “Effects of field spatial scale and predator colonization behavior on pest suppression in an agroecosystem: a modelling approach”, Computational and Mathematical Population Dynamics, Florida Atlantic University, Ft. Lauderdale, FL

May, 2019.

Invited Symposium talk “Surrogate species and risk assessment in applied ecology: A population model approach”, V International Conference on Applied Mathematics, Design & Control, Mathematical Methods and Modeling in Engineering and Life Sciences Meeting, Universidad Nacional de San Martín, Buenos Aires, Argentina. November 2018.

Invited seminar “Deconstructing the surrogate species concept: a life history approach to the protection of ecosystem services”, Estación Biológica de Doñana, Seville, Spain, September 2018.

Symposium (“Exploring the compatibility of arthropod biological control and pesticides: Models and data”) organizer and talk, “Protecting Assemblages of Biocontrol Species: Modeling a Surrogate Species Approach”, 5th International Symposium on Biological Control of Arthropods, Langkawi, Malaysia, September 2017.

Graduate seminar course, Matrix models and population dynamics: applications in conservation and ecotoxicology, Department of Ecology, Swedish University of Agricultural Sciences, Uppsala, Sweden, May-June 2017.

Invited symposium talk “Population models for the protection of ecosystem services”, Ecology and Evolutionary Biology Department, University of California, Santa Cruz, October 2016.

Symposium talk, “Life history approach to the protection of ecosystem services”, in Symposium “Population Consequences of Pest Management Tactics on Non-Target Species”, XXV International Congress of Entomology, Orlando, Florida, September 2016.

Symposium (“Population perspectives in agroecology”), organizer and talk “Population perspectives in pest management: a surrogate species approach”, 100<sup>th</sup> Annual Meeting of the Pacific Branch of the Entomological Society of America, Honolulu, HI, April 2016.

Invited talk “High impact practices in undergraduate education”, Swedish University of Agricultural Sciences (SLU), Uppsala, Sweden, January 2016.

Invited symposium talk, “Population models for the protection of ecosystem services”, Department of Entomology, Washington State University, Pullman, WA, December 2015.

Invited symposium talk “Population models for the protection of ecosystem services”, 27th IFIP TC7 Conference 2015 on Systems Modelling and Optimization, Sophia-Antipolis, France, July 2015.

Invited Seminar talk “Deconstructing the surrogate species concept: a life history approach to the protection of endangered species and ecosystem services”, Friday Seminar Series, Department of Biology, Lund University, Lund, Sweden, May 2015.

Invited Seminar talk “Forest management for bolstering wildlife species assemblages: Conservation challenges in an East African forest reserve”, Hanover Forest Science Seminar, Michigan State University, January 2015.

Invited symposium talk “The surrogate species approach to protecting biological diversity and ecosystem services: when can we extrapolate from a few species to many?”, 62<sup>nd</sup> Annual Meeting of the Entomological Society of America, Portland, Oregon, November 2014.

Invited Seminar “Surrogate species and the protection of endangered species and ecosystem services”, Finnish Food Safety Authority Evira, Helsinki, Finland, September 2014.

Invited Seminar talk "The surrogate species approach to protecting endangered species and ecosystem services: Integrating life history data into predictive population models", Department of Ecology, Swedish University of Agricultural Sciences, Uppsala, Sweden, April 2014.

Invited Colloquium talk “One size does not fit all! Surrogate species and the protection of endangered species and ecosystem services”, Claremont Center for the Mathematical Sciences, Claremont, California, February 2014.

Invited Science Seminar talk “Birds, beetles and elephants – oh my! Ecological cascades in an East African forest reserve”, Dominican University of California, San Rafael, CA, January 2014

Invited symposium talk “Ecosystem services and pesticide disturbance: integrating life history data into predictive population models”, 61<sup>st</sup> Annual Meeting of the Entomological Society of America, Austin, Texas, November 2013.

Invited symposium talk: “Biocontrol and pesticide disturbance: integrating life history data into predictive population models”, 4th International Symposium on Biological Control of Arthropods, Pucón, Chile, March 2013.

Invited research talk “Risk assessment in applied ecology: a population model approach”. California State University, Los Angeles, Department of Biological Sciences, Los Angeles, CA, November 2012.

Invited research talk “Risk assessment in applied ecology: a population model approach”. University of Southern California, Department of Mathematics, Los Angeles, CA November 2012.

Invited research talk “Risk assessment in applied ecology: a population model approach”. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina July 2012.

Invited symposium talk “The use of surrogate species in risk assessment: incorporating life history data into matrix models in order to avoid false negatives”, International Conference on Mathematical and Theoretical Biology”, Pune, India, January 2012.

Invited research talk “Experimental approaches in sustainability: pattern & process in agroecology”. UC Santa Cruz, Dept. of Environmental Studies, Santa Cruz, CA January 2012.

Invited research talk “Population models & data in applied ecology: surrogate species”, International Workshop on Simulation and Modeling related to Computational Science

- and Robotics Technology, Kobe University, Kobe, Japan, November 2011.
- Invited research talk “The use of surrogate species in risk assessment: incorporating life history data into matrix models in order to avoid false negatives”, Annual Meeting of the Society of Environmental Toxicology and Chemistry, Portland, Oregon, November 2010.
- Invited research seminar:” The cascading effects of elephant presence/absence on arthropods and an Afrotropical thrush in Arabuko-Sokoke Forest, Kenya”. National Museums of Kenya, Nairobi, Kenya, September 2010.
- Invited research seminar: “The cascading effects of elephant presence/absence on arthropods and an Afrotropical thrush in Arabuko-Sokoke Forest, Kenya”. Estación Biologica de Doñana, Seville, Spain, September 2010.
- Invited research seminar: “Competition-colonization tradeoffs in ecological communities: potential applications to disseminated cancer therapies”. Evolutionary dynamics in cancer: From mathematical models to clinical therapies, Almagro, Ciudad Real, Spain, September 2010.
- Invited research seminar: “Integrating research & teaching: Notes from the field”. Meeting of the University of Washington Board of Regents, March, 2010.
- Invited research seminar: “Insect population dynamics: applications in agroecology and conservation biology”. ECO-IGERT 4<sup>th</sup> Annual Retreat, Oregon State University, Corvallis, Oregon, May 2009.
- Invited research seminar "Insect population dynamics: using life history data and simple models in ecotoxicology". Department of Ecology & Evolutionary Biology, UC Santa Cruz, Santa Cruz, California. March, 2009.
- Invited research talk “Inverse problems in applied ecology: insect population dynamics”, 4<sup>th</sup> International Conference on Inverse Problems: Modeling and Simulation, Oludeniz-Fethiye, Turkey. May, 2008.
- Invited research talk “Insect population dynamics: models & experiments in agriculture and conservation”, International Symposium on Mathematical Modeling and Computational Methods in Science and Engineering, Kobe University, Kobe Japan. October, 2007
- Invited research seminar “Agriculture & conservation: temperate and tropical research”, Celebration of Scholarship Conference, Peninsula College, Port Angeles, Washington. June 2007.
- Invited research seminar “Ecotoxicology & insect population dynamics – beyond matrix models“, Ecosystem Informatics IGERT Colloquium, Oregon State University, Corvallis, Oregon. June 2007.
- Invited research seminar “Agriculture & Conservation: field experiments and models”, College of Forest Resources, University of Washington, Seattle, Washington. November, 2006.
- Invited research seminar “Agriculture: pest control and biological diversity”, School of Biological Sciences, Washington State University, Vancouver, Washington. April, 2005.

- Invited guest lecture “Agriculture, pest control, and conservation biology”, Department of Biology, Lewis & Clark College, Portland, Oregon, February, 2005.
- Invited panel member, “The role of the academic/educator in environmental justice” session, Environmental Justice: Action, Communities and Topics conference, Washington State University, Vancouver, Washington. February, 2005.
- Invited symposium talk “Insect population response to selective pesticides and vegetation diversity: field studies”, Society of Environmental Toxicology and Chemistry, Fourth World Congress, Portland, Oregon. November, 2004.
- Invited research talk “An alternative to ANOVA: population dynamics models in an aphid-broccoli agroecosystem”, North Carolina State University, North Carolina. November, 2004.
- Invited symposium talk "Insect ecology and spatial scale: insights from field experiments and meta-analyses", Annual Meeting of the Wildlife Society, Calgary, Alberta, Canada. September, 2004.
- Invited Plenary lecture “Agriculture & Biodiversity”, Annual Conference of Northwest Biology Instructors’ Organization (NWBIO), Tacoma, Washington. April, 2004.
- Invited research seminar “Beyond ANOVA: population dynamics models in an aphid-broccoli agroecosystem”, Department of Entomology, Washington State University, Pullman, Washington. March, 2004.

#### **CONTRIBUTED CONFERENCE PRESENTATIONS (since 2004):**

- Research talk, “Field spatial scale and predator colonization behavior mediates pest suppression in diversified agroecosystems”, 103<sup>rd</sup> Annual Meeting of the Pacific Branch of the Entomological Society of America, San Diego, CA, April 2019.
- Symposium talk, “Where in the world is undergraduate research?! Developing international research experiences for undergraduates” and Workshop “Sticky Situations: Play & active learning strategies for engaging in ethical decision making” (w/H. Haeger, C. Fresquez, B. Carlson, and M. Bassett), Council on Undergraduate Education (CUR) biennial conference, Tampa, FL, June 2016.
- Workshop “Shedding light on the hidden curriculum through undergraduate research” (w/H. Haeger and B.E. Clarkston), American Association of Colleges and Universities. Conference on Diversity, Learning, and Student Success. Philadelphia, PA. March 2016.
- “Reliability of surrogate species: Assessing sublethal and lethal effects using life history data and matrix models”, 33<sup>rd</sup> North American Annual Meeting, Society of Environmental Toxicology and Chemistry, Long Beach, CA, November 2012.
- “Parasitoids and ecological risk assessment: using life history data to predict population responses to pesticides”, 95<sup>th</sup> Annual Meeting of the Pacific Branch of the Entomological Society of America, Waikoloa, Hawaii, HI, March 2011.

- “Beetles, elephants, and an Afrotropical thrush: Ecological cascades in an East African forest reserve”, Annual Meeting of the Entomological Society of America, San Diego, CA, December 2010.
- “The use of surrogate species in risk assessment: predicting reliability using life history data”, 57<sup>th</sup> Annual Meeting of the Entomological Society of America, Indianapolis, IN, December 2009.
- “Arthropod diversity on coffee farms in Tarrazú, Costa Rica: sustainability and farmer practices”, 57<sup>th</sup> Annual Meeting of the Entomological Society of America, Indianapolis, IN, December 2009.
- “Differential equation models of population dynamics: Aphid mortality rate estimation techniques in ecotoxicology “, 55<sup>th</sup> Annual Meeting of the Entomological Society of America, San Diego, CA, December, 2007.
- “Natural vegetation within and around agroecosystems – effects on insect population dynamics and diversity”, Annual Pacific Branch Meeting of the Entomological Society of America, Wailea, Maui, HI. March 2006.
- “Beyond LC<sub>50</sub>: a population dynamics alternative to Leslie matrix models in risk assessment”, 53<sup>rd</sup> Annual Meeting of the Entomological Society of America, Ft. Lauderdale, FL. December, 2005.
- “Population dynamics models of insects in agroecosystems: an alternative to ANOVA”, International Conference on Approximation Methods for Design and Control, Buenos Aires, Argentina. March 2005.
- “Agricultural ecology: sustainability and conservation biology”, University and Community Conference, Cienfuegos, Cuba. January 2005.
- "Population dynamics models of vegetation diversity and pesticide sprays in a broccoli-aphid agroecosystem: an alternative to ANOVA in gauging the effectiveness of IPM", XXII International Congress of Entomology, Brisbane, Australia. August, 2004.

## **GRANTS & AWARDS:**

U.S. Department of Education, Ronald E. McNair Post-Baccalaureate Achievement Program grant, 2017-2022 (PI).

U.S. Department of Education, HSI-STEM grant, 2016-2021. Research-based interventions to increased STEM degree attainment (PI w/ co-PIs K. Roney & T. Horvath).

Research Grant, Earthwatch Institute, 2010-2012. “Pollinator services in a coffee agroecosystem in Tarrazú, Costa Rica”.

Founders’ Endowment Grant, UW Tacoma 2010. “Undergraduate research participation in conservation of endangered forest birds in Arabuko-Sokoke forest, Kenya”.

Royalty Research Grant/RRF Scholar Award, UW Office of Research, 2009-2011. "Conservation of a near-threatened East African bird: Linking East Coast Akalat population dynamics with arthropod resources in coastal Kenya".

Chancellor's Fund for Research & Scholarship Award, University of Washington, Tacoma, 2008-2009. "Effects of coffee farming practices on arthropod diversity in the Tarrazú coffee farms of Costa Rica".

Research Grant, Earthwatch Institute, 2007-2010. "Sustainable coffee systems in Tarrazú, Costa Rica", co-PI with Mark Chandler & Sebastian Castro Tanzi.

Distinguished Researcher Award, UW Tacoma 2005.

Founders' Endowment Grant, UW Tacoma 2005-2006. "Insect biodiversity in a tropical agroecosystem".

Brotman Award for Instructional Excellence (Environmental Science Program), University of Washington, 2004.

Royalty Research Grant, UW Office of Research, 2003-2004. "Insect biodiversity and vegetation complexity in a tropical agroecosystem".

Institute for Teaching Excellence (Invited Participant), UW Teaching Academy, June 2003.

U. S. Department of Agriculture, 1997-2000. "Selective Pesticides and Natural Enemies: Renewed Hope for IPM of Cole Crop Pests".

## **TEACHING:**

### **University of Washington, Tacoma**

TESC 120: Introductory Biology I (Autumn 2008).

TCORE 112/113: Food Production & Consumption: Global Connections (team-taught w/ Dr. Rachel May) (Winter 2008, 2009).

TESC 300: Introduction to Environmental Science (Winter, Autumn 2001; Winter 2006).

TESC 303: Sustainable Development in Kenya (team-taught w/Dr. Jim Gawel) (Winter 2010, 2012).

TESC 304: Tropical Ecology and Sustainability (Spring 2004, 2005, 2007, 2008; Autumn 2010).

TESC 310: Environmental Science Research Seminar (Autumn 2003).

TESC 340: Ecology and Its Applications (w/laboratory sections) (Autumn 1999; Winter, Autumn 2002; Autumn 2004).

TESC 336: Plants & People: The Science of Agriculture (Autumn 1997; Winter 1999; Winter, Autumn 2000; Summer 2001; Spring 2004).

TESC 342: Issues in Biological Conservation (Spring 2000).

TESC 362: Introduction to Restoration Ecology (Lab/Field) (Spring 2001, 2002, 2003, 2007; Autumn 2003, 2004, 2005, 2007, 2008, 2009, 2010, 2012).



TESC 404: Costa Rica Field Studies: Ecology & Community (Summer 2004, 2005, 2007, 2011, Winter 2015).

TESC 410: Environmental Science Senior Seminar (Autumn 2011, 2012).

TESC 440: Environmental Entomology (Lab) (Winter 2004, Autumn 2005, 2007, 2009).

TESC 452: Plants, Insects, and their Interactions (Field) (Spring 2000).

TESC 462/463/464: Restoration Ecology Network Capstone (I, II, and III) (Autumn 2004; Winter, Spring 2005).

Expedition Fellows (International Experiences for First- and Second-year students): Spring 2013, 2015 (Costa Rica).

### **California State University, Monterey Bay**

Costa Rica Field Research, Summer 2016, 2017, 2018, 2019.

### **Swedish University of Agricultural Sciences (SLU), Uppsala, Sweden**

Graduate course: Matrix models and population dynamics: applications in conservation and ecotoxicology May-June 2017.