MARK DAVID SCHULZE

Forest Director
H.J. Andrews Experimental Forest / Oregon State University
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APPOINTMENTS

Assistant Professor, Senior Research: Department of Forest Ecosystems & Society, Oregon State University, 2011 – present
Forest Director: HJ Andrews Experimental Forest, Oregon State University, November 2008 – present
Assistant Professor (courtesy): School of Forest Resources and Conservation, University of Florida, 2008 – 2016.
Research coordinator: Instituto Floresta Tropical, December 2007 – 2011
Post-doctoral Researcher: School of Forest Resources and Conservation, University of Florida, 2003 – 2007 (research adviser: Dr. Daniel Zarin).

EDUCATION

2003 Ph.D. in Botany, The Pennsylvania State University, Department of Biology.
1992 B.S., The Evergreen State College, Olympia WA.

PEER-REVIEWED ARTICLES

Drake, S.A., Rupp, D.E., Thomas, C.K., Oldroyd, H.J., Schulze, M.D., Jones, J.A. Increased Daytime Static Stability Enhances Sub-canopy Downslope Scalar Advection in a Coniferous Plantation Forest. 2022. *JGR Atmospheres* 129(9); https://doi.org/10.1029/2021JD036042.

Sibley, A., Schulze, M., Kennedy, A., Jones, J. Still, S. 2022. Canopy wetting patterns and the determinants of dry season dewfall in a temperate wet-forest. *Agricultural and Forest Meteorology* 323(8): 109069; https://doi.org/10.1016/j.agrformet.2022.109069.

Detto, M., Griffith, D.M., Hawkins, L., Helliker, B.R., Page, G.F.M., Pau, S., Rastogi, B., Schulze, M., Still, C.J. 2021. CORRIGENDUM: Imaging canopy temperature: shedding (thermal) light on ecosystem processes NEW PHYTOLOGIST 230:1746 https://doi.org/10.1111/nph.17927

Johnson, S.L., Henshaw, D., Downing, G., Wondzell, S., Schulze, M., Kennedy, A., Cohn, G., Schmidt, S.A., Jones, J.A., 2021. Long-term hydrology and aquatic biogeochemistry data from H. J. Andrews Experimental Forest, Cascade Mountains, Oregon. HYDROLOGICAL PROCESSES 35. https://doi.org/10.1002/hyp.14187

Seibold, S., Rammer, W., Hothorn, T., Seidl, R., Ulyshen, M.D., Lorz, J., Cadotte, M.W., Lindenmayer, D.B., Adhikari, Y.P., Aragon, R., Bae, S., Baldrian, P., Varandi, H.B., Barlow, J., Bassler, C., Beauchene, J., Berenguer, E., Bergamin, R.S., Birkemoe, T., Boros, G., Brandl, R., Brustel, H., Burton, P.J., Cakpo-Tossou, Y.T., Castro, J., Cateau, E., Cobb, T.P., Farwig, N., Fernandez, R.D., Firn, J., Gan, K.S., Gonzalez, G., Gossner, M.M., Habel, J.C., Hebert, C., Heibl, C., Heikkala, O., Hemp, A., Hemp, C., Hjalten, J., Hotes, S., Kouki, J., Lachat, T., Liu, J., Liu, Y., Luo, Y.-H., Macandog, D.M., Martina, P.E., Mukul, S.A., Nachin, B., Nisbet, K., O'Halloran, J., Oxbrough, A., Pandey, J.N., Pavlicek, T., Pawson, S.M., Rakotondranary, J.S., Ramanamanjato, J.-B., Rossi, L., Schmidl, J., Schulze, M., Seaton, S., Stone, M.J., Stork, N.E., Suran, B., Sverdrup-Thygeson, A., Thorn, S., Thyagarajan, G., Wardlaw, T.J., Weisser, W.W., Yoon, S., Zhang, N., Mueller, J., 2021. The contribution of insects to global forest deadwood decomposition. NATURE 597, 77+. https://doi.org/10.1038/s41586-021-03740-8

Sist, P., Piponiot, C., Kanashiro, M., Pena-Claros, M., Putz, F.E., Schulze, M., Verissimo, A., Vidal, E., 2021. Sustainability of Brazilian forest concessions. FOREST ECOLOGY AND MANAGEMENT 496. https://doi.org/10.1016/j.foreco.2021.119440

Still, C.J., Rastogi, B., Page, G.F.M., Griffith, D.M., Sibley, A., Schulze, M., Hawkins, L., Pau, S., Detto, M., Helliker, B.R., 2021. Imaging canopy temperature: shedding (thermal) light on ecosystem processes. NEW PHYTOLOGIST 230: 1746–1753. https://doi.org/10.1111/nph.17321

Wolf, C., Bell, D.M., Kim, H., Nelson, M.P., Schulze, M., Betts, M.G., 2021. Temporal consistency of undercanopy thermal refugia in old-growth forest. AGRICULTURAL AND FOREST METEOROLOGY 307. https://doi.org/10.1016/j.agrformet.2021.108520

Goralnik, L., Kelly, S.M., O'Connell, K.B., Nelson, M.P., Schulze, M. 2020. Forest discovery: place relationships on an environmental science, arts and humanities (eSAH) fieldtrip. Australian Journal of Environmental Education(2020), 1–12. DOI:10.1017/aee.2020.28.

Bastin, J.F. et al (134 authors). 2018. Pan-tropical prediction of forest structure from the largest trees. *Global Ecology and Biogeography* 27(11):1366-1383.

Brancalion, P.H.S., de Almeida, D.R.A., Vidal, E., Molin, P.G., Sontag, V., Souza, S.E.X.F., Schulze, M. 2018. Fake legal logging in the Brazilian Amazon. *Science Advances* 4(8): eaat1192.

Slik, J.W.F. et al. (125 authors). 2018. A phylogenetic classification of the world's tropical forests. PNAS 115(8): 1837-1842.

Ward, S., Schulze, M., Roy, B. 2018. A long-term perspective on microclimate and spring plant phenology in the Western Cascades. *Ecosphere* 9(10):e02451.

Free, C., Grogan, J., Schulze, M.D., Landis, R.M., and Brienen, R.J.W. 2017. Current Brazilian forest management guidelines are unsustainable for Swietenia, Cedrela, Amburana, and Copaifera: A response to da Cunha and colleagues. *Forest Ecology and Management* 386: 81-83.

Londres, M., Schulze M., Staudhammer, C., Kainer, K. 2017. Population structure and fruit production of Carapa guianensis (Andiroba) in Amazonian floodplain forests: implications for community-based management. *Tropical Conservation Science* 10:1-13.

Frey, S.J.K.; Hadley, A..; Johnson, S.L., Schulze, M.; Jones, J.A.; Betts, M. 2016. Spatial models reveal the microclimatic buffering capacity of old-growth forests. *Science Advances* 2(4) e1501392.

Wagner, F.H. et al (103 authors). 2016. Climate seasonality limits carbon assimilation and storage in tropical forests. *Biogeosciences* 13(8): 2537.

Slik, J.W.F. et al. (173 authors). 2015. An estimate of the number of tropical tree species. *Proceedings of the National Academy of Sciences* 112(24): 7472-7477.

Free, C., R.M. Landis, J. Grogan, M. Schulze, M. Lentini, O.Dunisch. 2014. Management implications of long-term tree growth and mortality rates: a modeling study of big-leaf mahogany (*Swietenia macrophylla*) in the Brazilian Amazon. *Forest Ecology and Management* 330: 46-54.

Grogan, J., R.M. Landis, C.M Free, M.D. Schulze, M Lentini, M.S. Ashton. 2014. Big-leaf mahogany *Swietenia macrophylla* population dynamics and implications for sustainable management. Journal of Applied Ecology 51: 664-674.

Grogan, J., Schulze, M. 2012. The impact of annual rainfall patterns on growth and phenology of emergent tree species in southeastern Amazonia, Brazil. *Biotropica* 44: 331-340.

Macpherson, A., D. Carter, M. Schulze, E. Vidal and M. Lentini. 2012. The sustainability of timber production from Eastern Amazonian forests. *Land Use Policy* 29: 339-350.

Grogan, J., M. Schulze, J. Galvão. 2010. Survival, growth and reproduction by big-leaf mahogany (Swietenia macrophylla) in open clearing vs. forested conditions in Brazil. *New Forests* 40: 335-347.

Macpherson, A., M. Schulze, E. Vidal and D. Carter. 2010. A Model for Comparing Reduced Impact Logging with Conventional Logging for an Eastern Amazonian Forest. *Forest Ecology and Management* 260: 2002-2011.

Macpherson, A., Carter, D., Lentini, M., and Schulze, M. 2010. Following the Rules: Brazilian logging concessions under imperfect enforcement and royalties. *Land Economics* 86(3): 493-513.

Keefe, K., M. Schulze, C. Pinheiro, J. Zweede and D. Zarin. 2009. Intensive management of liana-dominated forest patches as a silvicultural option for production forests in Amazonia. *Forest Ecology and Management* 258: 1950-1959.

Lentini, M., Schulze, M. and Zweede, J. 2009. Os desafios ao sistema de concessões de florestas públicas na Amazônia. *Ciência Hoje* 44: 34-36.

Grogan, J., and M. Schulze. 2008. Estimating the number of trees and forest area necessary to supply internationally traded volumes of tropical timber species: the case of big-leaf mahogany (Swietenia macrophylla) in Amazonia. *Environmental Conservation* 35: 26-35.

Grogan, J., S. Jennings, R.M. Landis, M. Schulze, A.M.V. Baima, J. do C.A. Lopes, J.M. Norghauer, L.R. Oliveira, F. Pantoja, D. Pintog, J.N.M. Silva, E. Vidal, and B. Zimmerman. 2008. What loggers leave behind: big-leaf mahogany (Swietenia macrophylla) population structure and potential for post-logging recovery in the Brazilian Amazon. *Forest Ecology and Management* 255: 269-281.

Schulze, M. 2008. Technical and financial analysis of enrichment planting in logging gaps as a potential component of forest management in the eastern Amazon. *Forest Ecology and Management* 255:866-879.

Schulze, M., J. Grogan, and E. Vidal. 2008. Technical challenges to sustainable forest management in concessions on public lands in the Brazilian Amazon. *Journal of Sustainable Forestry* 26(1): 61-75.

Schulze, M., J. Grogan, and E. Vidal. 2008. Forest certification in Amazonia: standards matter. *Oryx* 42: 229-239.

Schulze, M., J. Grogan, R.M. Landis, E. Vidal. 2008. How rare is too rare to harvest? Management challenges posed by timber species occurring at low densities in the Brazilian Amazon. *Forest Ecology and Management* 256: 1443-1457.

Schulze, M., J. Grogan, C. Uhl, M. Lentini and E. Vidal. 2008. Evaluating ipê (Tabebuia, Bignoniaceae) logging in Amazonia: sustainable management or catalyst for forest degradation? *Biological Conservation* 141: 2071-2085.

Valle, D., P. Phillips, E. Vidal, M. Schulze, J. Grogan, M. Sales and P. van Gardingen. 2007. Adaptation of a spatially explicit individual tree-based growth and yield model and long-term comparison between reduced-impact and conventional logging in eastern Amazonia, Brazil. *Forest Ecology and Management* 243: 187-198.

Zarin, D.J., M.D. Schulze, E. Vidal, and M. Lentini. 2007. Beyond reaping the first harvest: management objectives for timber production in the Brazilian Amazon. *Conservation Biology* 21(4): 916-925.

Schulze, M., and J. Zweede. 2006. Canopy dynamics in unlogged and logged forest stands in the eastern Amazon. *Forest Ecology and Management* 236: 56-64.

Valle, D., M. Schulze, E. Vidal, J. Grogan and M. Sales. 2006. Identifying bias in stand-level growth and yield estimations: a case study in eastern Brazilian Amazonia. *Forest Ecology and Management* 236: 127-135.

Grogan, J., M. Schulze, and E. Vidal. 2005. Apoio científico para os padrões de manejo de madeira na floresta amazônica – a questão da sustentabilidade. *Ciência & Ambiente* 32, 103-117.

Schulze, M., E. Vidal, J. Grogan, J. Zweede, and D. Zarin. 2005. Madeiras nobres em perigo: práticas e leis atuais de manejo florestal não garantem a exploração sustentável. *Ciência Hoje* 36: 66-69.

Schulze M., N. Seavey and D.F. Whitacre. 2000. A comparison of the Phylostomid bat assemblages in undisturbed Neotropical forest and in forest fragments in a Slash-and-burn farming mosaic in Peten, Guatemala. *Biotropica* 32(1): 174-184.

Schulze, M., J.L. Cordova, N.E. Seavy, and D.F. Whitacre. 2000. Behavior, diet and breeding biology of double-toothed kites at a Guatemalan lowland site. *The Condor* 102: 113-126.

Cochrane M., and M. Schulze. 1999. Fire as a recurrent event in tropical forests of the eastern Amazon: effects on structure, biomass and species composition. *Biotropica* 31: 2-10.

Cochrane, M., Alencar, A., Souza Jr., C.M., Schulze, M.D., Nepstad, D.C., Lefebvre, P, and Davidson, E. 1999. Positive feedbacks in the fire dynamic of closed canopy forests. *Science* 284: 1832-1835.

Schulze M. and D.F. Whitacre. 1999. A classification and ordination of the tree community of Tikal National Park, Peten, Guatemala. *Bulletin of the Florida State Museum of Natural History* 41(3): 169-297.

Cochrane M., and M. Schulze. 1998. Forests fires in the Amazon. *Conservation Biology* 12(5): 948-950.

Seavy, N., M. Schulze, and D. Whitacre. 1998. Breeding biology and behavior the Plumbeous Kite. *Wilson Bulletin* 110(1): 77-85.

Seavy N., M. Schulze and D.F. Whitacre. 1997. The diet and hunting behavior of the Plumbeous Kite. *Wilson Bulletin* 109(3): 526-532.

Seavy, N., M. Schulze and D.F. Whitacre. 1997. Two Plumbeous Kites (*Ictinia plumbea*) capture swallow. *Journal of Raptor Research* 31(3):289.

BOOK CHAPTERS

Nelson, M., Gosnell, H., Warren, D., Batavia, C., Betts, M., Burton, J.I., Davis E. J., Schulze, M., Segura, C., Friesen, C., Perakis, S. 2017. An Integrated Social-Ecological-Ethical Approach to Enhancing Public Trust in Federal Forest Management. *In*: B. Van Horne and D.H. Olsen (eds.) Innovations in Forestry to Sustain People and Biodiversity: Lessons from Moist Coniferous Forests of the Pacific Northwest. Island Press.

Schulze, M., and N. Seavy. 2012. The Double-toothed Kite (*Harpagus bidentatus*). *In*: D.F. Whitacre (ed) Neotropical Birds of Prey: Biology and Ecology of a Forest Raptor Community. Cornell University Press, Ithaca, NY, 428 pp.

Seavy, N., M. Schulze and D.F. Whitacre. 2012. The Plumbeous Kite (*Ictinia plumbea*). *In*: D.F. Whitacre (ed) Neotropical Birds of Prey: Biology and Ecology of a Forest Raptor Community. Cornell University Press, Ithaca, NY, 428 pp.

Whitacre, D.F. and M. Schulze. 2012.. The Maya Forest. *In*: D.F. Whitacre (ed) Neotropical Birds of Prey: Biology and Ecology of a Forest Raptor Community. Cornell University Press, Ithaca, NY, 428 pp.

Revilla, M.M., de Souza, A.D., M. Schulze, M. 2011. Ipé Roxo (*Tabebuia impetiginosa*). *In:* P. Shanley, G. Medina, & M. Cymerys (eds.), Fruit Trees and Useful Plants in Amazonian Lives, pp. 81-90. Rome, FAO 353 pp.

Shanley, P. and M. Schulze. 2011. Jatobá (*Hymenaea courbaril*). *In:* P. Shanley, G. Medina, & M. Cymerys (eds.), Fruit Trees and Useful Plants in Amazonian Lives, pp. 90-100. Rome, FAO 353 pp.

Schulze, M. Lentini, A. Macpherson, J. Grogan. 2010. Certification, concessions, and biodiversity in the Brazilian Amazon: can an independent, market-based approach be wed to a large government initiative? *In*: Putz, F.E., D. Sheil, & R. Zagt (eds.) Forest Certification and the Conservation of Biodiversity, pp. 83-89. Tropenbos International, Wageningen, the Netherlands, 244 pp.

Shanley, P. and M. Schulze. 2010. Jatobá (*Hymenaea courbaril*). In: Shanley, P., Serra, M., Medina, G. (eds.), Frutiferas e Plantas Úteis na Vida Amazônica (second edition, revised and expanded), pp. 109-118. CIFOR, Bogor, Indonesia, 316 pp.

Shanley, P. and M. Schulze. 2010. Ipé Roxo (*Tabebuia impetiginosa*). In: Shanley, P., Serra, M., Medina, G. (eds.), Frutiferas e Plantas Úteis na Vida Amazônica (second edition, revised and expanded), pp. 99-108. CIFOR, Bogor, Indonesia, 316 pp.

Schulze, M., Grogan, J., Vidal, E. 2008. O manejo florestal como estratégia de conservação e desenvolvimento socioeconômico na Amazônia: quanto separa os sistemas de exploração madeireira atuais do conceito de manejo florestal sustentável? In: Bensusan, N., Armstrong, G. (Eds.), O Manejo da Paisagem e a Paisagem do Manejo. IEB: Brasilia, DF, Brazil, pp. 163-213.

Cochrane, M.A., Alencar, A., Schulze, M.D., Souza Jr., C.M., Lefebvre, P. and Nepstad, D.C. 2002. Investigating positive feedbacks in the fire dynamic of closed canopy tropical forests. *In*: Land Use and Deforestation in the Amazon, edited by Charles Wood and Roberto Porro. Center for Latin American Studies, University of Florida.

Madrid, J.A., C. Marroquin, T. Dubon Ortiz, M. Schulze, J. Hunt and D.F. Whitacre. 1993. Monitoring population parameters of a wintering migrant songbird, the Kentucky Warbler - persistence pays. *In*: The Symposium Volume from the First International Wildlife Congress, September 25-29, 1993, San Jose, Costa Rica.

Whitacre D.F., J. Madrid, C. Marroquin, T. Dubon, N. Jurado, W. Tobar, B. Gonzalez, A. Arevalo, G. Garcia, M. Schulze, L. Jones, J. Sutter, A. Baker. 1993. Slash-and-burn farming and bird conservation in northern Peten, Guatemala. *In*: Marcia Wilson (ed.) Conservation of Neotropical Birds in Mexico. Los Tuxtlas, Veracruz, Mexico.

Whitacre D.F., J. Madrid, C. Marroquin, M. Schulze, L. Jones, J. Sutter and A. Baker. 1993. Migrant songbirds, habitat change, and conservation prospects in northern Peten, Guatemala: some initial results. pp. 339-345 in: D.M. Finch and P.W. Stangel (eds.), Status and Management of Neotropical Migratory Birds. USDA Forest Service general technical report RM-229.

CONTRIBUTIONS TO EDITED VOLUMES

Goralnik, L, O'Connell, K., Schulze, M., Nelson, M.P. 2015. H.J. Andrews Forest Discovery: a conceptual framework for interdisciplinary interpretation. *In*:Proceedings of the 2015 Symposium on Experiential Education Research, Association for Experiential Education, Portland Oregon, pp 30-34.

Lentini, M., M. Schulze, A. Dias, J. Zweede. 2010. A importância da capacitação e treinamento para a expansão do manejo florestal na Amazônia. In: Verissimo (ed) Fatos Florestais. IMAZON, Belem, Pará, Brazil, pp 88-90.

Schulze, M., M. Lentini, J. Zweede. 2009. Training needs for RIL and improved forest management. *In*: Angelson, A. (ed) Realising REDD+: National strategy and policy options, p. 257. CIFOR, Bogor, Indonesia, 362 pp.

Schulze, M. 2008. Certified timber or threatened medicinal? *In*: Shanley, P., Pierce, A., Laird, S., Robinson, D. (Eds.), Beyond Timber: Certification and Management of Non-timber Forest Products, p. 35. Center for International Forestry Research (CIFOR), Bogor, Indonesia, pp. 144.

Schulze, M. 2004. Moveis ou remedios? *In*: Shanley, P., Medina, G. (Eds.), Frutiferas e Plantas Úteis na Vida Amazônica. Mulheres da Mata/IMAZON: Belém, PA, Brazil, p. 113.

Schulze, M. 2004. Uma poupança na mata. *In*: Shanley, P., Medina, G. (Eds.), Frutiferas e Plantas Úteis na Vida Amazônica. Mulheres da Mata/IMAZON: Belém, PA, Brazil, p. 105.

Schulze, M. and P. Shanley. 2006. Madeira certificada ou produtos medicinais ameaçados? *In*: Shanley, P., Pierce, A., Laird, S. Alem de Madeira: Certificação de Produtos Nao-madeireiros, p. 52. CIFOR/Forest Trends, Bogor, Indonesia, pp. 153.

TECHNICAL REPORTS

Withrow-Robinson, B., Einerson, J., Schulze M., Livesay, M., Johnson, S., Daly, C. Tracking Climate Change: Blazing new paths of communication. Rural Connections Spring/Summer 2019.

Grogan, J., Schulze, M., Free, C.M., Landis, R.M., Pires, I.P., Morales, G.P., Johnson, A. 2016. How Sustainable is Mahogany management? *ITTO Tropical Forest Update* 25/1: 5-9.

Johnson, S.L., Friesen, C., Schulze, M. 2015. Bridging science and management at the H.J. Andrews Experimental Forest. *Western Forester* 60(4): 5-7.

Grogan, J., Free, C., Schulze, M., Landis, R.M., Lentini, M., Vidal, E. Big-Leaf Mahogany in Brazil & South America: A one-stop location for information on big-leaf mahogany (Swietenia macrophylla, Meliaceae). http://www.swietking.org/index.html

Grogan, J., Schulze, M., Lentini, M., Zweede, J., Landis, R.M. 2013. Managing big-leaf mahogany in natural forests: Lessons learned from the ITTO-CITES Timber Project. *ITTO Tropical Forest Update* 21/2: 12-15.

Lentini, M., L. Stoner, J. Zweede, M. Schulze. 2010. Promoting adoption of sustainable forest management in the Brazilian Amazon: why capacity building is important to conserve Amazonian forests. *ITTO Tropical Forest Update*.

Grogan, J., and M. Schulze. 2003. Report and recommendations: Rohden forest management area field visit, Juruena-MT, November 10-14, 2003. United Nations Development Program, Global Environment Facility Programme, Brasília, DF, Brazil.

Whitacre, D.F., Schulze M., and N. Seavy. 1997. Ecological Impacts of Current Land-use Activities in the Maya Biosphere Reserve, Guatemala: Effects of Shifting Cultivation and Selective Logging on Forest Bird and Tree Community Composition. Final Technical Report to U.S. Man and the Biosphere Program.

Schulze M., J.L. Cordova and D.F. Whitacre. 1996. Effects of Selective Logging on Bird and Tree Community Composition in Peten, Guatemala. Technical report to the U.S. Man and the Biosphere Program.

Whitacre, D.F., Schulze M., and N. Seavy. 1995. Habitat affinities of a Central American forest avifauna: implications for conservation in Neotropical slash-and-burn farming landscapes. Technical report to the U.S. Man and the Biosphere Program.

Whitacre, D.F., M. Schulze, J. Hunt, and N. Seavey. 1993. Comparative impacts of two kinds of forest management/logging practices at Cooperativa Bethel, Petén, Guatemala. Technical report to Conservation International.

Schulze, M. 1992. A preliminary description of woody plant communities of Tikal National Park. pp. 53-61 in: Whitacre, D.F. and R.K. Thorstrom. Progress Report V, 1992, Maya Project: use of raptors and other fauna as environmental indicators for design, management and monitoring of protected areas and for building local capacity for conservation in Latin America. The Peregrine Fund, Boise, Idaho. 260 pp.

DISSERTATION

Schulze, M. Ecology and behavior of nine timber species in Pará, Brazil: links between species life history and forest management and conservation. Ph.D. dissertation, Dept. of Biology, Pennsylvania State University. 2003. 355 pp.

GRANTS, FELLOWSHIPS & AWARDS

2020-2026	Co-author and Senior Personnel - Long-Term Ecological Research at the H.J. Andrews Experimental Forest (LTER8), NSF DEB ($7,126,000)
2014 – 2020	Co-author and Senior Personnel - Long-Term Ecological Research at the H.J. Andrews Experimental Forest (LTER7), NSF DEB ($6,762,000)
2014 – 2019	PI - Joint venture agreement # PNW 14-JV-11261952-058, "Enhancing long term research and data management at the H.J. Andrews Experimental Forest" ($265,659)
2014 – 2016	Collaborator – USFS PNW Research Station Research Proposal, "Evaluating stand thinning as a means to mitigate drought within specific topography" ($50,000)
2015 – 2016	Co-I – Gray Family Foundation, Hummingbird Watch ($10,000).
2014 – 2015	Co-I - Renewable Resources Extension Act (RREA) Program, OSU, "Citizen Science Climate Research: Linking natural resource managers and other citizens to science they use" ($20,000)
2014 – 2015	Co-PI - Fundação de Amparo à Pesquisa do Estado de São Paulo, "Monitoramento de longo prazo da dinâmica de uma floresta explorada de forma convencional e com técnicas de manejo florestal na Amazônia oriental e suas relações com Mudanças Climáticas nas Florestas Manejadas para a Produção de Madeira" (R$156,475).
2014 – 2015	Co-I – Gray Family Foundation, "Linking Teachers & Students to Citizen Science Climate Research" ($19,288)
2012 – 2015	Co-PI – ITTO-CITES "Bigleaf mahogany (*Swietenia macrophylla*) in the Brazilian Amazon: long-term studies of population dynamics and regeneration ecology towards sustainable forest management" ($193,488 renewal)
2012	OSU Technology Resource Fee Award "Enhancement of student access, research, and education at the HJ Andrews Experimental Forest" ($11,637)

2011 – 2016	PI – Joint Venture Agreement # PNW 11-JV-11261952-054 USFS-OSU, "Evaluation and Synthesis of Long Term Forest-Stream Data from the H.J. Andrews Experimental Forest" ($95,000)
2010 - 2015	PI - Joint venture agreement # PNW 10-JV-11261952-104 USFS-OSU, "Developing education and research infrastructure and programs at the H.J. Andrews Experimental Forest" ($85,300)
2010 – 2014	PI – NSF FSML DBI-0934310 "The Andrews GREEN House: Green Research and Education for Ecological Networks" ($349,000)
2010 – 2011	Co-PI – ITTO-CITES "Bigleaf mahogany (*Swietenia macrophylla*) in the Brazilian Amazon: long-term studies of population dynamics and regeneration ecology towards sustainable forest management" ($65,000 renewal)
2010	OSU Technology Resource Fee Award "Enhancement of HJ Andrews Experimental Forest Student Computer Resources: GPS Package" ($10,027)
2009 – 2013	PI - Joint venture agreement # PNW 10-JV-11260489-026 USFS-OSU, "Developing a Cross-site Stream Chemistry Database and Data Harvester ($295,550)
2009 – 2011	Co-author – USAID Brazil Forest Enterprise Cluster grant to Instituto Floresta Tropical ($900,000)
2009	OSU Technology Resource Fee Award "Enhancement of HJ Andrews Experimental Forest Student Computer Resources" ($4,191)
2008 – 2010	Co-author - CNPq # 481097/2008-2 (Brazilian NSF equivalent), (R$101,945 ≈$70,000) "Geracao de informacoes para subsidiar o uso sustentavel dos recursos madeireiros e nao-madeireiros de florestas Amazonicas, visando o aprimoramento das boas praticas de manejo florestal"
2008 - 2010	Co-investigator - USFS ITTF to support research on bigleaf mahogany ($33,000)
2008 - 2010	Co-PI – ITTO-CITES research grant "Bigleaf mahogany (*Swietenia macrophylla*) in the Brazilian Amazon: long-term studies of population dynamics and regeneration ecology towards sustainable forest management" ($98,000)
2007 - 2010	Co-author - Moore Foundation Andes Amazon Initiative grant ($1.9 million) to the Instituto Floresta Tropical
2005 - 2009	Co-author - European Commission grant ENV/2004/081-390 (€ 2.3 million) to IMAZON
2003 - 2007	Co-author - US AID grant 512-A-00-03-00026-00 ($3.8 million) to the ALFA consortium
2002	Co-author - US AID grant ($200,000) to IMAZON
2002	Co-author - Overbrook Foundation grant ($15,000) to IMAZON
2001	Henry W. Popp Fellowship, Pennsylvania State University
2001	Biology Departmental Fellowship, Pennsylvania State University
1999	Charles A. and Anne Morrow Lindbergh Foundation grant ($10,580)
1999	International Tropical Timber Organization Research fellowship ($7,000)
1999	Lincoln Park Zoo, Scott Neotropic Fund grant ($7,500)
1999	Conservation, Food & Health Foundation grant ($10,000)
1998 & 1999	J. Ben and Helen D. Hill Award for Plant Sciences, Penn. State University ($500 each year)
1997 & 1998	Sophie Danforth Conservation Biology Award, Roger Williams Park Zoo & Rhode Island Zoological Society ($1,000 each year)
1996 & 2000	Braddock Fellowship, Pennsylvania State University
1996-1999	National Science Foundation Graduate Research Fellowship in Biology

AGREEMENTS, GRANT & AWARD IMPLEMENTATION

2008 – 2021	OSU PI on USFS-OSU Cost Reimbursement Agreements with ca. $125,000 recurring annual budget (08-CR-11261952-497; 13-CR-11261952-024; 18-CR-11261952-042; 19-CR-11261952-123; 21-CR-11261952)
2008 – 2015	NSF LTER 6 Award to OSU Andrews Forest (PI on four indices = $329,900)
2008 – 2012	NSF FSML DBI-0829480 Award to OSU Andrews Forest (responsible for implementation and management of $147,000 budget; became grant PI in 2011)

FUND-RAISING

2009 – present Member of Andrews Forest Foundation Management Team responsible for fund-raising efforts and project implementation to support research, education, arts and humanities programs at the H.J. Andrews Experimental Forest.

STUDENT ADVISING

Graduate Committee Member:

Marina Londres, University of Florida MS 2010
Kate Jones, Oregon State University, MS 2012
Sarah Ward, University of Oregon, MS 2018
Jake Kleinknecht, Oregon State University, MS 2014
Ali Malek, Oregon State University, PhD 2019
Stephanie Schmidt, Oregon State University, MS 2019
Adam Sibley, Oregon State University, PhD 2021
Samuel Woodrich, Oregon State University, MS 2022
Nina Ferrari, Oregon State University, MS Candidate

Board of Examiners Member (Brazilian system):

Rodrigo Costa Pinto, University of São Paulo, qualification exam 2020, MS defense 2021
Jéssy Senado, University of São Paulo, MS defense 2021

Non-committee Graduate Research Advisor:

Marco Lentini, University of Florida, MS 2008
Denis Valle, University of Florida, MS 2009
Alexander MacPherson, University of Florida, PhD 2010
Sarah Frey, Oregon State University, PhD 2014
Jessica Celis, Oregon State University, MS 2015
Elise Heffernan, Oregon State University, M.S. 2017
Chris Free, Rutgers University, PhD 2018
Informal research advice given as requested to 5-10 students per year at H.J. Andrews

Undergraduate Research Advisor:

Sarah Perez-Sanz , NSF REU student 2010
Sarah Ward, NSF REU student 2012
Janel Hull, NSF REU student 2014

Faculty liaison with Andrews Forest LTER Graduate Student Group 2014 - Present

RESEARCH EXPERIENCE

Research coordinator: Instituto Floresta Tropical, December 2007 – 2011

- Coordination & development of silvicultural research program in eastern Amazon.

Co-investigator: Phenology component of NSF LTER research program at OSU/Andrews Forest, 2009 – present.

Post-doctoral Researcher: School of Forest Resources and Conservation, University of Florida, November 2003 – December 2007 (research adviser: Dr. Daniel Zarin).

- Coordination of collaborative research on Amazonian forest ecology and management involving UF and the Brazilian institutes, Institute of People and the Environment in Amazonia (IMAZON) and Instituto Floresta Tropical (IFT). The research program comprised more than a dozen projects and integrated conservation biology, silviculture and forest ecology, economics and policy.

- Grant-writing: Co-authored proposals to support research, training and extension in forest management and conservation in the eastern Amazon (grants to IMAZON and IFT).
- Advising: U.S. graduate students (2 doctoral and 1 master's) and Brazilian novice researchers (3 university graduates and 4 university students) on ecological research projects.

Visiting Researcher: IMAZON, Belém, Brazil, January – November 2003.

- Grant-writing, design and implementation of research on tree species population ecology, silviculture and sustainable forest management.

Doctoral Researcher: Department of Biology, The Pennsylvania State University, 1996 – 2003 (research adviser: Dr. Christopher Uhl).

- Field study of the ecological impacts of logging, potential for sustainable forest management and population dynamics of high-value timber trees species in the Brazilian Amazon.

Visiting Researcher: IMAZON, June 2002.

- Co-authored proposal to US AID that was funded to support on-going and new research initiatives in tropical forest ecology and management.

Consultant: IMAZON and U.S. Forest Service, November 2001.

- Assisted with design of long-term demonstration project for sustainable management of mahogany.

Consultant: Brazilian Ministry of the Environment - IBAMA, Santarem, Brazil, November 2000.

- Designed field trials of liana-cutting methods to reduce logging impacts in the Tapajós National Forest.

Consultant: Wildlife Conservation Society, Petén Guatemala, March 2000.

- Designed vegetation sampling protocol for study of Scarlet Macaw habitat use and trained Guatemalan field technicians.

Principal Investigator: The Peregrine Fund, Petén, Guatemala, 1995 – 1999.

- Field study of tree regeneration, growth and response to logging disturbance.
- Assessment of logging impacts on forest bird communities.

Co-investigator: The Pennsylvania State University, 1996 – 1998.

- Field and remote-sensing study of the effects of fire on eastern Amazonian forests and spatiotemporal dynamics of human land use and forest fires.

Field Supervisor: The Maya Project, The Peregrine Fund, Petén, Guatemala, 1994.

- Directed 10 field projects (employing 30 U.S. and Guatemalan researchers), including studies of forest raptor breeding biology and behavior, and the impacts of selective logging on forest bird and tree community composition.

Researcher: The Maya Project, The Peregrine Fund, Petén, Guatemala, 1992 – 1994 (supervisor: Dr. David Whitacre). Designed and implemented field studies of:

- Tree distribution patterns and community composition.
- Plumbeous and Double-toothed Kite breeding and foraging ecology.
- Bat communities in undisturbed forest and in forest fragments within a slash-and-burn mosaic.
- Structure and composition of 3-25 year old second growth forest.
- Songbird populations in mature and second growth forest.

Wildlife Biologist: U.S. Forest Service, Six Rivers National Forest, California, March – August 1991.

- Census and monitoring of Spotted Owl populations in Habitat Conservation Areas.

Seasonal Field Researcher: Manomet Bird Observatory, Rio Bravo Conservation and Management Area, Belize, 1989-1991 (research mentor: Dr. Nicholas Brokaw).

- Supervised the establishment of four one-hectare permanent vegetation study plots.
- Assisted on bird and bat population monitoring projects, and tree phenology studies.

EDUCATION & OUTREACH EXPERIENCE

Field lecturer: HJ Andrews Experimental Forest, 2008 - present.

Andrews research, forest ecology, hydrology and management for courses from OSU and other regional and international universities and colleges, as well as researchers, teachers, K-12 students, managers and the general public.

Guest lecturer: Graduate-level Tropical Forestry Field Course (FOR 6172), Univ. of Florida, Brazil, 2004-2007.

- Lectured on: tree species population ecology, silviculture, forest response to logging disturbance, and prospects for sustainable forest management
- Assisted with conducting and translating course field activities at Fazenda Cauaxi demonstration forest.

Guest lecturer: Tropical Forest Management field courses, Instituto Floresta Tropical 1999-2007

- Lectured (in Portuguese and English) to Brazilian and international students from technical schools and universities on: research needs for forest management, silvicultural principles for sustained-yield forestry, stand- and species-level response to logging disturbance.
- Assisted with field exercises (primarily when English- or Spanish-speaking students were involved)

Co-Instructor: Graduate-level Tropical Forestry Field Course (FOR 6934), Univ. of Florida, Pará, Brazil. 2002.

- The course provided a multi-disciplinary perspective on current issues in forest conservation and management in Amazonian Brazil. Readings and seminar discussions focused on forest policy, conservation, and ecology. Field activities included: intensive hands-on study of conventional and best-practice forest management; visits to rural communities attempting to improve livelihoods through forest stewardship; investigation of the impacts of current land use practices on forest conservation and socio-economic stability in Amazon "frontier" regions.

Co-Instructor: Field Ecology (Biol. 450), Pennsylvania State University, 2001.

- This course focused on developing students' powers of observation and capacity for asking and answering ecological questions. Students participated in weekly observational and experimental field exercises that led them through a progression from learning to make natural history observations, to honing questions arising from natural curiosity into workable research questions, and finally using field sampling methods and basic quantitative analyses to answer research questions. We introduced ecological theory through lectures and seminar discussions of technical and non-technical readings in natural history, human ecology and conservation. Students developed scientific writing skills through maintenance of natural history journals and preparation of technical papers. Throughout the semester, students were mentored in the development of independent ecological field projects. Students explored human ecology and conservation by designing "ecology in action" projects that combined research with local conservation action.

Consultant: Tropical Forest Foundation – FFT, Paragominas, Brazil, October 2000.

- Provided Portuguese-English translation for field course in forest management.

Consultant: World Bank and IMAZON, December 2000.

- Translated the manuscript "Sustainable Amazon: Limitations and Opportunities for Development" from Portuguese to English.

Guest instructor: Field Ecology (Biol.450), Pennsylvania State University, 1997- 2003.

- Conducted field exercises geared towards developing observation skills and learning to answer research questions with appropriate field sampling techniques. Topics included: forest regeneration; changes in composition with topography and soil; re-constructing forest history; and patterns of gypsy moth abundance and impact on tree populations.

Teaching Assistant & Laboratory Instructor: Introductory Biology (Biol. 110), Pennsylvania State University, 1996.

- Lab activities covered the major themes of biology from the cellular to ecosystem level. A major emphasis was placed on teaching students scientific writing (designated as a writing-intensive course).

SYNERGISTIC ACTIVITIES

Director of H.J. Andrews Experimental Forest. Responsibilities include: coordination of review and facilitation of new research projects (ca.60 new and ongoing projects in any year); onsite outreach and education (1,500 visitors per year including K-12 and university classes, land managers, and external researchers); research and field station facilities administration and enhancement.

Central Cascades Adaptive Management Partnership steering committee member, 2008 - present. The partnership among state and federal research and management entities creates opportunities for scientists and managers to work together to find solutions to complex

resource management challenges on federal lands in the Pacific Northwest, with an emphasis of the Central Cascades region.

Advisor to Tropical Forest Institute (IFT, Belem, Brasil), a Brazilian organization dedicated to developing, teaching and promoting sustainable tropical forest management practices, 2003-present.

Board Member, Organization of Biological Field Stations, 2011-2013.

Contributor to OSU Extension's Oregon Natural Resources Education Program, Teachers as Research Program, helping to host research training workshops and advise teachers on research projects 2009 –present.

OSU representative in Canopy Connections Middle School Environmental Science Program, a partnership between University of Oregon, H.J. Andrews Experimental Forest and the Pacific Tree Climbing Institute, 2009 - present.

Andrews Forest representative on McKenzie Watershed Council, 2016 – present.

Recipient of Oregon State University College of Forestry Dean's Award for Excellence in Service, 2013.

Recipient of OSU University Outreach and Engagement Vice Provost Award of Excellence for Numbers in Nature, Math on the Mountain, 2017.

Recipient of OSU Extension Association Search for Excellence Award for Outstanding Leadership in Educational Programming for Oregon Season Tracker, 2019.

REVIEWER

Annals of Forest Science, Biological Conservation, Biotropica, Climatic Change, Environmental Management, Forest Ecology and Management, International Journal of Forest Research, New Forests, Plant Biology.

LANGUAGES

Portuguese – proficient
Spanish – functional