

# **MICHAEL P. HAMILTON, PH.D.**

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## **EXPERIENCE**

Canemah Nature, owner  
Oregon City, Oregon (2016 - present)

Director/ Academic Coordinator II, Blue Oak Ranch Reserve  
University of California, Berkeley Natural Reserve System (2007- 2016) - now retired

Director/ Principal Museum Scientist, James San Jacinto Mountains Reserve  
University of California, Riverside Natural Reserve System (1982-2008)

## **EDUCATION**

1983 Doctorate of Philosophy in Natural Resources, Cornell University, Ithaca New York

1979 Master of Science in Biology, California State Polytechnic University, Pomona

1976 Bachelor of Science in Biology, California State Polytechnic University, Pomona

## **SCIENTIFIC AND ADVISORY BOARDS**

2018 - 2024 Clackamas Community College, Environmental Learning Center, founding member of the Ecology Professionals Technical Advisory Committee

2021 - 2023 Playa Center for the Intersection of Art and Science, Science Council

2019 - 2021 vice-chairman of the Natural Resources Advisory Committee (NRC) for Oregon City, Oregon

2016 - 2019 Feather River Land Trust - Land Stewardship Committee

2013 - 2016 Research Advisory Committee, Hopland Research and Extension Center, UC Davis.

1997 - 2022 Founding Board Member, first web czar, and member of the Advisory Council for the Society for Conservation GIS

2000 - 2009 Founding Chairman, UC Natural Reserve System, Information Management Committee

2005 - 2008 Steering committee for the Center for Conservation Biology, College of Natural and Agricultural Sciences, University of California, Riverside.

2005 - 2006 Member of the Sensors and Sensor Networks committee, CLEANER: Collaborative Large-scale Engineering Analysis Network for Environmental Research

2004-2015 Served on various NSF review panels, and individual proposal reviews each year.

2004 - 2007 Co-Chairman of the Sensors & Sensor Networking subcommittee of the Facilities and Infrastructure Committee, NEON National Ecological Observatory Network, National Design Consortium (NDC). I have also served on the NEON Design Team to assist with development of prototype FIU technology, and CyberInfrastructure, and have been a lead in organizing the California Ecological Observatory Network (CaleON), a regional group to assist NEON in coordinating planning activities within the Pacific Southwest Domain.

2001 - 2008 Member of the Research Executive Committee, UCLA Center for Embedded Networked Sensing

1996 - 2000 Member of the Technical Advisory Committee for the California Statewide Natural Diversity Data Base (California State Department of Fish and Game)

1991-1995 Board of Directors, Mt. San Jacinto Winter Park Authority, Palm Springs Aerial Tramway

1989-1999 Member of the California Native Plant Society Statewide Rare Plant Scientific Advisory Committee

1989 - 1990 Member of the Riverside County Growth Management Element Policy Advisory Committee

1987 - 1990 Riverside County Planning Department Technical Advisory Committee on the Stephen's Kangaroo Rat

1986 - 2002 Founding member of the Coordinated Resources Management Planning Interagency Team (CRMP), San Jacinto Mountains, California

## **REPORTS, PUBLICATIONS AND PROFESSIONAL MEETINGS**

2023 Michael Hamilton. The Urban Forest Digital Twin: Technologies to build virtual forests for urban forestry, STEM education, and public outreach. Presentation given in the session: Towards a Better Understanding of Urban Forests: Innovative and Emerging Methods for Monitoring Urban Tree Health and Quantifying Ecosystem Services in Cities. Ecological Society of America, Annual Meeting, Portland, Oregon. August 7, 2023.

2019 Michael Hamilton. Animal, Vegetable, Robot: How Eco-technologies have Transformed Field Research and Conservation Science at Ecological Reserves. Invited speaker, Department of Natural Resources, Cornell University, Ithaca, New York. October 29, 2019.

2015 Michaella Chung, Carrick Detweiler, Michael Hamilton, James Higgins, John-Paul Ore and Sally Thompson. Obtaining the Thermal Structure of Lakes from the Air. *Water*. 7, 6467-6482; doi:10.3390/w7116467.

2015 Michael Hamilton. All Watched Over by Machines of Loving Grace. Keynote address to the 17th annual meeting of the Society for Conservation GIS. July 26, 2015. Asilomar Conference Center, Monterey, California.

2014 Michael Hamilton. Drones, Nodes, and Apps: perspectives and prospects for the next generation of ecological applications using Micro Aerial Vehicles. Workshop on Robotic Monitoring at Robotics: Science and Systems Conference. July 12-14, 2014, University of California, Berkeley, California.

2013 Joel A. Granados, Eric A. Graham, Philippe Bonnet, Eric M. Yuen, Michael Hamilton. EcolP: An Open Source Image Analysis Toolkit to Identify Different Stages of Plant Phenology for Multiple Species with Pan-Tilt-Zoom Cameras. *Ecological Informatics* 15 (2013) 58–65.

2013 Detweiler, Elbaum, Burgin, Waite, Thompson, and Hamilton. Co-Aerial Ecologist: Robotic Water Sampling and Sensing in the Wild. Poster presentation at the National Robotics Initiative PIs Meeting. Washington, DC. September, 2013.

2012 Koohafkan, M.; Thompson, S. E.; Hamilton, M. P. Predicting Potential Evaporation in Topographically Complex Terrain. Paper presented at the annual meeting of the American Geophysical Union, December 4-9, 2012, Moscone Conference Center, San Francisco, California.

2011 Michael Hamilton, Todd Dawson, Sally Thompson. The Very Large Ecological Array. Paper presented at the annual meeting of the American Geophysical Union, December 4-9, 2011, Moscone Conference Center, San Francisco, California.

2010 TE Dawson, MP Hamilton. Wireless Sensor Networks: Tools for improving the ecological characterization of land surfaces. Paper presented at the annual Fall meeting of the American Geophysical Union, December, Moscone Conference Center, San Francisco, California.

2010 Michael Hamilton, Todd Dawson, Iris Stewart-Frey, Joseph Gomez. The Very Large Ecological Array. Poster presented at the 13th annual meeting of the Society for Conservation GIS, July 8-11, 2010, ASILOMAR Conference Center, Pacific Grove, California.

2010 Teresa Ko, Shaun Ahmadian, John Hicks, Mohammad Rahimi, Deborah Estrin, Stefano Soatto, Sharon Coe, Michael Hamilton. Heartbeat of a Nest: Using imagers as biological sensors. *ACM Transaction on Sensor Networks*, Vol. 6, Issue 3, Article 19, June 2010.

2009 Priya Gupta, Michael E. Loik, Gregor Hsiao, Randy Apodaca, Michael P. Hamilton, Sharon J. Martinson, Iain Green, Todd Dawson. Capturing small-scale variations of water isotopes in ambient air and natural waters of California: Results of field measurements using Wavelength

Scanned Cavity Ring-Down Spectroscopy. Poster presented at AGU Chapman Conference, 4-8 October, 2009, Boise, Idaho.

2009 Barbara J Benson, Barbara J Bond, Michael P Hamilton, Russell K Monson, and Richard Han. Perspectives on Next Generation Technology for Environmental Sensor Networks. *Front Ecol Environ* 2010; 8(4): 193–200.

2009 Eric A Graham; Eric M Yuen; Geoff F Robertson; William J Kaiser; Michael P Hamilton; Philip W Rundel. Budburst and leaf area expansion measured with a novel mobile camera system and simple color thresholding. *Environmental and Experimental Botany*. 65: 238–244.

2008 Michael P. Allen, Eric Graham, Shaun Ahmadian, Teresa Ko, Eric Yuen, Lewis Girod, Michael Hamilton, Deborah Estrin. Interactive Environmental Sensing: Signal and Image Processing Challenges. 33rd International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Las Vegas, March 30 - April 4, 2008

2007 Allen, M.F., R. Vargas, E. Graham, W. Swenson, M. Hamilton, M. Taggart, T.C. Harmon, P. Rundel, B. Fulkerson, D. Estrin. Soil sensor technology: life within a pixel. *BioScience*. Vol. 57. No. 10. pp. 859-869.

2007 Peter Corke, Carrick Detwiler, Matthew Dunbabin, Michael Hamilton, Daniela Rus and Luliu Vasilescu. Experiments with Underwater Robot Localization and Tracking. *Proceedings of the IEEE International Conference on Robotics and Automation*, Rome, ITALY, April 10-14, 2007: 4556-4561.

2007 Michael P. Hamilton, Phillip W. Rundel, Michael A. Allen, William Kaiser, Deborah E. Estrin, Eric Graham. New Approaches in Embedded Networked Sensing for Terrestrial Ecological Observatories. *Environmental Engineering Science*. 24(2): 192-204.

2007 Shaun Ahmadian, Teresa Ko, Sharon Coe, Michael Hamilton, Mohammad Rahimi, Stefano Soatto, and Deborah Estrin. Heartbeat of a Nest: Using Imagers as Biological Sensors. Center for Embedded Network Sensing. Article 1113.

2007 Niles Hasselquist, E Mayzlish Gati, K Kitajima, Michael P. Hamilton, and Michael F. Allen. Understanding Soil Respiration: an integrated approach. Center for Embedded Network Sensing. Article 2103.

2007 Joey Degges, Shaun Ahmadian, Sharon Coe, Teresa Ko, John Hicks, Mohammed Rahimi, Michael Hamilton, Stefano Soatto, and D Estrin. Evaluation of Imagers in a Biological Sensing Deployment. Center for Embedded Network Sensing. Article 2089.

2007 Ahmadian, Shaun; Allen, Michael; Coe, Sharon; Graham, Eric; Hamilton, Michael; King, Jaime; et al. Imagers as Biological Sensors. UC Los Angeles: Center for Embedded Network Sensing.

2006 Eric A. Graham, Michael P. Hamilton, Brent D. Mishler, Philip W. Rundel, and Mark H. Hansen. Use of a Networked Digital Camera to Estimate Net CO<sub>2</sub> Uptake of a Desiccation-tolerant Moss. *Int. J. Plant Sci.* 167(4):751-758. 2006.

2006 Brian Fulkerson; Stefano Soatto; Mike Allen; Mike Taggart; & Michael Hamilton. (2006). Adventures in Automating Ecological Image Analysis. UC Los Angeles: Center for Embedded Network Sensing.

2006 J. Goldman; D. Estrin; M. Hamilton; T. Harmon; & W. Kaiser. Facilitating the Adoption of Embedded Networked Sensing by Emerging National Environmental Observatories. UC Los Angeles: Center for Embedded Network Sensing.

2006 Michael P. Hamilton; Phil Rundel; Eric Graham; Michael Allen; Deborah Estrin; Mark Hansen; et al. TEOS: Terrestrial Ecology Observing Systems Overview of Embedded Networked Systems and EMISSARY Tools for Instrument Management and Data Exploration. UC Los Angeles: Center for Embedded Network Sensing.

2006. Rodrigo Vargas; Alisha Glass; Mike Taggart; Kuni Kitajima; Michael Hamilton; & Michael Allen. Linking minirhizotron images to soil physical properties and microbial diversity. UC Los Angeles: Center for Embedded Network Sensing.

2005 Vargas R, Allen M, Swenson W, Hamilton M. Soil embedded networked systems for studying soil carbon dynamics: the A-MARSS project. Third USDA Symposium on Greenhouse Gases and Carbon Sequestration in Agriculture and Forestry. March 21-24, 2005, Baltimore, Maryland

2005 Arzberger, Peter, et. al. Sensors for Environmental Observatories. Report of an NSF sponsored Worksop. November 30 - December 2, University of Washington, Seattle.

2005 Michael Wimbrow, Kevin Browne, Michael Taggart, Sean Askay and Michael Hamilton. CMS Habitat Sensing Interface. CENS Technical Poster Series.

2004 Hamilton, Michael. CENS: new directions in wireless embedded networked sensing of natural and agricultural ecosystems. In: Converging Technologies for Agriculture and Environment, Sir Mark Oliphant Conference 2004. Melbourne, Australia.

2004 Szewczyk, Robert, Eric Osterweil, Joseph Polastre, Michael Hamilton, Alan Mainwaring and Deborah Estrin. Habitat Monitoring with Sensor Networks. Communications of the ACM. June Vol. 47, No. 6, pp. 34-40.

2004 Ambrose, Richard, Deborah Estrin, Michael Hamilton, Tom Harmon, Jenny Jay, William J. Kaiser, Gregory J. Pottie, Mani Srivastava, Gaurav Sukhatme, John Villasenor, et. al. Networked Infomechanical Systems (NIMS). CENS Technical Poster Series.

2004 Hamilton, Michael. Integrated Use of Embedded Sensor Networks. Keynote paper presented to the Future Science Forum, Science, Research, and Development. Department of Primary Industries, State of Victoria, Melbourne, Australia. April 28-29, 2004.

2003 Estrin, Deborah, William Michener & Gregory Bonito, et. al.. Environmental Cyberinfrastructure Needs for Distributed Sensor Networks. A

Report from a National Science Foundation Sponsored Workshop 12-14 August 2003 Scripps Institute of Oceanography. San Diego.

2003 Allen, Michael, Thanos Boulis, Kevin Browne, Naim Busek, Vlad Bychkovskiy, Deborah Estrin, Michael Hamilton, Sheri Lubin, Mohan Mysore, Eric Osterweil, Mohammad Rahimi, John Rotenberry, Stefano Soatto, Mani Srivastava, Michael Taggart, Thomas Unfried, Michael Wimbrow. Habitat Sensing at the James San Jacinto Mountains Reserve. CENS Technical Poster Series.

2002 Mishler, B. and M. Hamilton. The MossCam Project: the world's first remote-sensing project on moss ecology. Annual meeting, American Bryological and Lichenological Society. Storrs, Connecticut.

2002 Flaxman, M., Hamilton, Michael P., Steinitz, C., Ervin, S. and Edwards, K. Urban Intermix Fire Hazard Assessment: An Alternative Futures Approach. U.S. International Association of Landscape Ecologists Conference. Lincoln, Nebraska, USA. Apr. 2002.

2002 Browne, Kevin E., Michael P. Hamilton, Sheri L. Lubin and Brent D. Mishler. The MossCam Project. CENS Technical Poster Series.

2001 Alberto Cerpa, Jeremy Elson, Deborah Estrin, Lewis Girod, Michael Hamilton, and Jerry Zhao. Habitat Monitoring: Application Driver for Wireless Communications Technology. Proceedings of the First ACM SIGCOMM Workshop on Data Communications in Latin America and the Caribbean, 3-5 April, 2001, San Jose, Costa Rica.

2001 Withy, Alison, et. al. Scaleable Information Networks for the Environment. Report of an NSF-sponsored workshop, San Diego Supercomputer Center, UC San Diego. October 29-31, 2001.

2001 Lubin, Sheri L., Kevin Browne and Michael P. Hamilton. Virtual Wildlife Observatory. CENS Technical Poster Series. 1999 Hamilton, Michael P. Forging the link between NRS science and natural resource stewardship. AAAS Annual Meeting & Science Innovation Exposition. 165: 21-26 January, 1999. A.21.

1997 Notebook of a Digital Naturalist. Weekly environmental science and natural history articles originally published in the Idyllwild Town Crier (September 1996-January 1997). Now posted to the World Wide Web at [www.digitalnaturalist.com](http://www.digitalnaturalist.com)

1995 Mountain Communities Area Forest Stewardship Plan and GIS Database. A report submitted to California Department of Forestry and Fire Protection, Pine Cove, California.

1994 Hamilton, Michael P. and Michael Flaxman. Scientific Data Visualization and Biological Diversity Monitoring. California Forest Pest Council, Proceedings of the 43rd Annual Meeting.

1992 Hamilton, Michael P. and M. Flaxman. Scientific data visualization and biological diversity: new tools for spatializing multimedia observations of species and ecosystems. Landscape and Urban Planning. 21:285-287.

1992 Gorentz, John B. and Michael P. Hamilton. Chapter IV-- Summary of the Workshop Survey Questionnaire and Pre- workshop Demonstrations, In:

Organization of Biological Field Stations and Southern Association of Marine, Gorentz, John B. Editor. Data Management at Biological Field Stations and Coastal Marine Laboratories: Report of an Invitational Workshop, April 22-26, 1990. W.K. Kellogg Biological Station, Michigan State University. Prepared for National Science Foundation, Division of Biotic Systems and Resources, Biological Research Resources Program.

1991 Hamilton, Michael P. and M. Flaxman. Scientific data visualization and biological diversity: new tools for spatializing multimedia observations of species and ecosystems. In: Proceedings of Data Visualization Techniques in Environmental Management Workshop, Environmental Monitoring Systems Laboratory, Las Vegas, Nevada, May 7-10, 1991.

1991 Hamilton, Michael P. and M. Flaxman. Biodiversity visualization: developing new tools for the scientific visualization of rare species and significant ecosystems. In: Proceedings of the 11th annual ESRI Users Conference. Vol. 1, pp. 33-42.

1990 Hamilton, Michael P. The MacroScope Ecology Laserdisc: A Hypermedia Database For Natural Resources Management And Conservation Biology. University of California, Riverside, Biology Department.

1990 Hamilton, Michael P. The MacroScope Ecology Laserdisc Demonstration Stack. In: Encyclopedia of Multimedia, a Higher Education CD-ROM/Videodisc Sampler. Apple Computer.

1989 Hamilton, Michael P., L.A. Salazar, and K. E. Palmer. Geographic Information Systems: Providing Information for Wildland Fire Planning. Fire Technology. Vol. 25:1, pp 5-23.

1986 Hamilton, Michael P. The MacroScope: An Interactive Videodisc System for Environmental and Forestry Education. In: Forestry Microcomputer Software Symposium, West Virginia University, Morgantown, WV. June 29-July 2, 1986. Pg. 479-493.

1986 Hamilton, Michael P., and J.P. Lassoie. Rare Plant Management in Wilderness: Theory, Design and Implementation. In: Proceedings - National Wilderness Research Conference: Current Research. Colorado State University. USDA Forest Service. Intermountain Research Station. General Technical Report INT-212. Pg. 100-107.

1986 Hamilton, Michael P.; Lassoie, James P. Rare plant management in wilderness: theory, design and implementation. In: Lucas, Robert C. Proceedings of the national wilderness research conference: Current research. USDA Forest Service Gen. Tech. Rep. INT-212.

1986 Hamilton, Michael P., and C.D. Pumphrey. Coordinated Resources Management Planning for the Mountain Communities Area, San Jacinto Mountains, California.

1985 Hamilton, Michael P., W.W. Mayhew, R. Minnich, and N. Ellstrand. Management Plan for the James San Jacinto Mountains Reserve. University of California, Natural Reserve System.

1984 Hamilton, Michael P. An Ecological Guide to the Wildflowers of the San Jacinto Mountain Wilderness. Mount San Jacinto Natural History Association. 120 pp.

1984 Hamilton, Michael P. Management Plan for the Mt. San Jacinto State Wilderness Area. California State Department of Parks and Recreation, Sacramento, California. 84 pp.

1983 Hamilton, Michael P. A floristic basis for the management of rare plants and their communities in the San Jacinto Mountains, California. Dissertation Thesis. Cornell University. 189 pp.

1983 Hamilton, Michael P. Addendum to the Management Plan for the San Jacinto Wilderness. San Jacinto Ranger District, San Bernardino National Forest, San Bernardino, California. 49 pp.

1981 Hamilton, Michael P. Human Use, Effects on Wilderness, Management, Being Studied (California). Ecological Restoration. 1981 Vol. 1. Pg 27.

1980 Hamilton, Michael P. Continuum - Hanglidosaurus. OMNI. Vol 3:8 (May 1981). pg. 48.

1979 Hamilton, Michael P. The application of electronic monitoring to the study of pollination ecology. Masters Degree Thesis. California Polytechnic University, Pomona. 73 pp.

## GRANTS AND CONTRACTS

2013-2016 USDA National Institute of Food and Agriculture (National Robotics Initiative), Co-Aerial-Ecologist: Robotic Water Sampling and Sensing in the Wild, PI: Detweiler, Co-PIs (University of Nebraska, Lincoln): Elbaum, Burgin, Waite; Co-PIs (U.C. Berkeley, Thompson, Hamilton. - \$956,210

2012-2015 State of California Wildlife Conservation Board. Blue Oak Ranch Reserve Multi-Use Facilities and Infrastructure Project. Michael Hamilton, Todd Dawson, CoPI - \$4,887,000

2010-2012 National Science Foundation. Division of Biological Infrastructure. Academic Research Infrastructure. University of California Cyberinfrastructure Renovation. Peggy Fiedler, PI, Mark Stromberg, Michael Hamilton, CoPI - \$710,115

2009-2011 National Science Foundation. Division of Biological Infrastructure. Field Stations and Marine Laboratories Program. FSML Very Large Ecological Array. Todd Dawson, PI, Michael Hamilton, Co-PI - \$247,771

2007-2009 National Science Foundation. Division of Biological Infrastructure. NEON Program. NEON CI/ECI Preliminary Design and Diagnostic Testbed. David Schimel, PI, Michael Hamilton, Chaitanya Baru, Richard O'Grady, Aaron Falk, Co-PI - \$ 482,348

2004-2010 National Science Foundation, Biocomplexity Program, Automated-Minirhizotron and Arrayed Rhizosphere-Soil Sensors [A-MARSS]. Michael Allen, PI, Edith Allen, Michael Hamilton, Thomas Harmon, James Borneman, Co-PI - \$1,998,999

2004-2010 National Science Foundation, Biocomplexity Program, Sensor Arrays for Acoustic Monitoring of Bird Behavior and Diversity. Charles Taylor, PI, Michael Hamilton, Co-investigator - \$2,000,000

2003-2008 National Science Foundation, Integrated Technology Research, NIMS: Networked Info-mechanical Systems. William Kaiser, PI, Deborah Estrin, Gregory Pottie, Thomas Harmon, John Villasenor, Co-PI, Michael Hamilton, Co-investigator - \$7,500,000

2002-2012 National Science Foundation, Science and Technology Center, CENS: Center for Embedded Networked Sensing. Deborah Estrin, PI, Michael Allen, Thomas Harmon, Mark Hansen, Gaurav Sukhatme, Co-PI, Michael Hamilton, former Co-PI - \$40,000,000

2001-2004 National Science Foundation, IERI Program, What are the 'Developmental Needs' of Young Children in Science?: Revision of Developmental Constraints on K-3 Science Education Kathleen Metz, Principal Investigator, Michael Hamilton, Co-investigator - \$667,338

1997-1998 University of California, Academic and Professional Series Professional Development Awards, Travel grant to South Africa, Namibia, and Botswana to conduct research and planning for a field course- \$5,000

1996-2002 California Department of Forestry and Fire Protection, Apple Computer, University of California and Federal Emergency Management Agency. Mountain Communities Firesafe Community Project. Michael Hamilton, PI- \$858,000

1994-1995 California Department of Forestry and Fire Protection, and Pine Cove Property Owners Association, Development of an Ecologically-based Forest Stewardship Plan for the San Jacinto Mountain Communities, Idyllwild, CA. Michael Hamilton, PI- \$14,800

1993 Zen Center of Los Angeles, Biological Assessment and Impact Analysis for renewal of Riverside County Public Use Permit No. 564, Garner Valley, San Jacinto Mountains, CA. - \$2,600

1993-1994 Richard A. Grant family and Sustainable Conservation, Inc. , Biodiversity Survey and Scientific Data Visualization to Assist in the Coordination of a Land Stewardship Plan for the Fleming Ranch, May Valley, San Jacinto Mountains, CA - \$8,400

1993-1994 California Department of Parks and Recreation, Development of a Wildland Prescribed Fire Management Geographic Information Systems

1993 USDA-Forest Service, San Bernardino National Forest, Challenge Cost Share agreement to develop the Hall Canyon Research Natural Area Management and Monitoring Plan - \$2,000

1992-1993 USDA-PSW Forest Fire Laboratory, Riverside, Digital video image processing to assess tree and stand responses to air pollution - \$8,000

1991-1992 Apple Computer Corporation. Chernobyl: Ecological Glasnost and Applied Information for the Aftermath. - \$150,000 (with John Baldwin and David Hulse, University of Oregon, Eugene)

1991-1992 John and Catherine MacArthur Foundation. Chernobyl: Ecological Glasnost and Applied Information for the Aftermath. -\$250,000 (with John Baldwin and David Hulse, University of Oregon, Eugene)

1991-1992 Hardman Foundation, Applications of Computer-based Image Processing for Monitoring Rare Plant Populations in the San Jacinto Mountains, California- \$500

1991-1994 Apple Computer, Inc. Vivarium Program. Seed grant to support planning for the Biodiversity Visualization Laboratory - \$12,400

1990-1991 University of California, Academic and Professional Series Professional Development Awards, Travel grant to conduct research and planning for the development of a Biodiversity Visualization Laboratory- \$3,000

1990-1991 Man and the Biosphere Program, U.S. Dept. of State, Ecosystem Comparison and Management of the Montane Forests in the Peninsular Range of the Californias -\$30,000

## **TEACHING**

2023 - Guest Speaker: Bio 313 Forest Canopy Ecophysiology: Drone Mapping and Canopy Modeling Lab - Reed College, Portland, Oregon

2023 - Technology Tools for Natural Resources Management - Clackamas Community College, Environmental Learning Center, Oregon City, Oregon

2012 - 2015 California Naturalist - Plants curriculum, Sagehen Creek Field Station, UC Berkeley, Truckee, California

2007 Sensing Technology for the Soil Environment. CENS Summer Field Course. Team taught with Michael Allen, Eric Graham and Rodrigo Vargas.

2004 - 2007 For the Birds: Landscapes and Habitats of San Diego and the Southern California Coast, Cornell University Adult Education

2003 - 2007 CENS Undergraduate Research Internship, sponsored by NSF REU and STC Education Network 2004-05 UCR BLCN 193 Seminar in Conservation Biology: eco-technologies. Team taught with Michael Allen

1998 - 1999 Honors Advanced Biology, (11-12 grade), Idyllwild Arts Academy, Idyllwild, California

1996 - 2000 Wilderness Ecology of the San Jacinto Mountains, UC Riverside Extension

1989 - 1992 Tropical Biology of Venezuela, Cal Poly, Pomona, Biology Department, and Universidad Central de Venezuela, Institute for Tropical Zoology  
1987 - 2001 Interactive Multimedia for Educators, UC Riverside and UC San Diego Extension, and Idyllwild Arts Academy

1988 - 2000 Field Ecology of the Southwest, Cal Poly, Pomona, Biology Department, and Universidad Central de Venezuela, Institute for Tropical Zoology

1988 - 1990 Ecological Image Processing, Universidad Central de Venezuela, Institute for Tropical Zoology

1984 - 2002 Wildflowers: the High Mountain Meadows, UC Riverside and UC San Diego Extension

1983 - 2006 Palms to Pines: A Natural History of the San Jacinto Mountains, UC Riverside, UC Los Angeles, and UC San Diego Extension

## **HONORS AND PROFESSIONAL ASSOCIATIONS**

2020 - 3rd Place, "Faces of Biology" Photography Competition, American Institute of Biological Sciences, BioScience 71: 327–329.

2006 - CSIRO Sir Frederick McMaster Fellowship

2001 - Luxuriant Flowing Hair Club for Scientists

1997 - Society for Conservation GIS (co-founder)

1995 - Richard Greenwood Award, Idyllwild Environmental Group

1994 - Good Apple Award, Hemet Unified School District

1990 - Honorary Trailfinder

1990 - Macworld Superstacks Contest, Honorable Mention "The Macroscopic Ecology Laserdisc"

1983 - Sigma Xi Scientific Research Society (elected, full member)

1983 - Organization of Biological Field Stations

1980 - Natural Areas Association (life member)

1979 - Mount San Jacinto Natural History Association (co-founder, past chairman)

1976 - Graduated cum laude, California State Polytechnic University, Pomona

**COMMUNITY SERVICE**

1992 - 1997 Idyllwild School, School Site Council, past chairman

1991- 2006 Idyllwild Environmental Group, founding board member

1990 - 2004 Chapman Ranch School, board of directors, past chairman

1983 - 1990 Isaac Walton League, Idyllwild Chapter, past president

1979 - 2006 Mount San Jacinto Natural History Association, founding board member, past chairman