

# Lee Worden

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Born: November 24, 1969 — San Francisco, California, United States

Nationality: United States

## Areas of specialization

Applied mathematics; stochastic and deterministic dynamical systems; ecology and evolution.

## Chronology

- 1990–1994 Undergraduate research associate and software developer, San Francisco State University  
Dept. of Engineering, Automatic Speech Recognition project  
Supervisor: Tom Holton
- 1993 Accepted to Summer Research Experience for Undergraduates program, Santa Fe Institute,  
Crutchfield and Mitchell's Evolving Cellular Automata program
- 1994 Senior research presentation: Genetic Algorithms
- 1994 **BA, Mathematics; BS, Computer Science**, San Francisco State University
- 1994–1995 Member of Technical Staff, The Filoli Information Systems Co., Palo Alto, Calif.
- 1996–1997 Software Developer, Farcast, Inc., San Francisco, Calif.
- 1997–2003 PhD Student, Program in Applied and Computational Mathematics, Princeton University
- 1998–2002 Department of Energy Computational Science Graduate Fellow
- 1998 **Santa Fe Institute Complex Systems Summer School**, Santa Fe, N.M.
- 1999 Visiting student, UC Berkeley Dept. of Integrative Biology  
Host: Tom (Zack) Powell
- 2000 **Practicum visitor, Santa Fe Institute, Los Alamos National Laboratory**, supervised by  
Alan Perelson  
Co-organizer, **SFI evolutionary ecology study group**, with Ricard Solé, J. Doyne Farmer  
and colleagues
- 2003 **PhD, Applied and Computational Mathematics**, Princeton University  
Faculty advisor: Simon A. Levin
- 2003–2005 **Postdoctoral Researcher**, Pacific salmon population dynamics, UC Davis  
Supervisors: Alan M. Hastings, Louis W. Botsford
- 2005–2007 **S.V. Ciriacy-Wantrup Postdoctoral Fellow**, UC Berkeley  
Faculty mentors: Richard M. Norgaard, Ignacio Chapela

- 2007–present Independent research in stochastic processes on graphs
- 2005–present Principal organizer, Nonlinear Dynamics and Social Change study group, Berkeley, Calif.
- 2007–present Social network analysis software consultant, Skye Benders-de Moll, Oakland, Calif.
- 2007–present Commons Committee, California Studies Association
- 2008–present **Author of Working Wiki software package** (<http://lalashan.mcmaster.ca/theobio/projects>), an extension to the MediaWiki software system for mathematical researchers, as a consultant to McMaster University Department of Biology, Hamilton, Ontario, Canada  
Principal Investigator: Jonathan Dushoff
- 2008, 2009 New England Workshop of Science and Social Change (focusing on teaching, innovation, discussion, and collaboration), Woods Hole, Mass., organized by Peter Taylor, U. Mass.
- 2008 **Heinz von Foerster prize** for best paper by a young scholar, American Society for Cybernetics annual meeting
- 2008 Cornell Probability Summer School, Ithaca, N.Y.
- 2009 Working group, Integrating functional and evolutionary dynamics at multiple scales, NIM-BioS, University of Tennessee, organized by Joan Roughgarden and colleagues, Stanford University

## Publications

- 2000 Hartvigsen, G., L. Worden, and S. A. Levin. 2000. “Global cooperation achieved through small behavioral changes among strangers.” *Complexity* 5(3):14–19.
- 2002 Dushoff, J., L. Worden, J. Keymer, and S. A. Levin. 2002. “Metapopulations, community assembly and scale invariance in aspect space.” *Theoretical Population Biology* 62:329–338.
- 2003 Worden, L. 2003. *Evolution, Constraint, Cooperation, and Community Structure in Simple Models*. PhD Dissertation.  
Subject matter includes modeling self-organization processes in ecological communities; evolution in the context of ecological communities; transformations between competitive and cooperative interactions in ecological (Lotka-Volterra and related) and game theory models; and ways scientific models function as rhetorical tools in social contexts and how alternative models can be used to intervene in accepted economic and social discourses.
- 2006 Ma, J., L. Worden, and S. A. Levin. 2006. “Evolutionary branching of single traits.” Chapter 10 of *From Energetics to Ecosystems: The Dynamics and Structure of Ecological Systems*, N. Rooney, K. S. McCann, and D. L. G. Oakes, eds. Springer Netherlands.
- 2007 Worden, L. and S. A. Levin. 2007. “Evolutionary escape from the prisoner’s dilemma.” *Journal of Theoretical Biology* 245(3):411–422.
- Worden, L. “Notes from the Greenhouse World: A Study in Coevolution, Planetary Sustainability, and Community Structure.” To appear in *Ecological Economics*.
- Worden, L. “Counterculture, cyberculture, and the Third Culture.” To appear in *West of Eden: Communes and Utopia in Northern California*, I. Boal, C. Winslow, M. Watts, and J. Stone, eds. Univ. of Calif. Press.
- Worden, L., L. W. Botsford, A. Hastings, and M. D. Holland. “Population dynamic consequences of variability in age of spawning and survival rates of Pacific salmon.” Submitted

to *Theoretical Population Biology*.

- Worden, L. and S. A. Levin. “A simple dynamic argument for self-regulation in model biospheres.” In preparation.

## Presentations

- July 2002 “Evolution and mutualism in fundamental models for ecological interactions.” DOE Computational Science Graduate Fellowship Conference, Washington, DC
- Aug. 2004 “Adaptive dynamics of mutual aid.” Ecological Society of America, Tucson, Ariz.
- March 2004 “Thoughts about model making and power.” Energy and Resources Group weekly speaker series, UC Berkeley
- July 2004 “Transformation, cooperation, and community structure.” International Society for Ecological Economics, Montreal, Québec
- July 2004 “Modeling early returns, fluctuation, and cohort resonance in Pacific salmon.” Society for Mathematical Biology, Ann Arbor, Mich.
- March 2006 “The rise and fall of the Whole Earth Catalog.” West of Eden: Communes and Utopia in Northern California, Berkeley, Calif.
- May 2008 “A simple dynamic argument for biospherical self-regulation.” American Society for Cybernetics, Champaign-Urbana, Ill.
- June 2008 “Evolutionary graph theory and structural power” (poster presentation). Networks in Political Science, Cambridge, Mass.
- June 2008 “A simple dynamic argument for biospherical self-regulation.” Cornell Probability Summer School, Ithaca, N.Y.
- Aug. 2008 “How selection acts on interactions, and why it favors mutual benefit.” Symposium on New Approaches to the Evolution of Social Behavior, Ecological Society of America, Milwaukee, Wisc.
- Dec. 2008 “Structural power in hub-spoke networks.” Network Politics Seminar, Berkeley, Calif.